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# Open Educational Resources Handbook 1.0

for educators





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# About this handbook

Welcome to the world of Open Educational Resources (OER). This handbook is designed to help educators find, use, develop and share OER to enhance their effectiveness online and in the classroom.

Although no prior knowledge of OER[1] is required, some experience using a computer and browsing the Internet will be helpful. For example, it is preferable that you have experience using a word processor (e.g. Open Office[2] or Microsoft Word) and basic media production software, such as an image editor (e.g. Gimp[3], Inkscape[4] or Photoshop).

The handbook works best when there is some sort of OER you would like to create or make available to others, but it is also useful for the curious reader.

There are several ways to use this handbook, including:

- ▶ Cover-to-cover, which is intended for newcomers who want to gain an understanding of OER and engage in the whole development cycle (find, compose, adapt, use, share, ...) in a real world setting;
- ▶ Individual sections, as a quick reference for educators engaged in OER development looking for pointers at any stage in the OER development cycle.

You are not expected to be an instructional designer or media production expert to use this book. If you encounter a term with which you are unfamiliar, check the glossary at the end of the handbook for a definition.

## WHAT THIS HANDBOOK DOES NOT COVER

OER is a broad topic and it would be difficult, if not impossible, to cover it comprehensively. This handbook does not include tutorials on the software used, though the URLs of some tutorials have been provided. It also does not prescribe a particular teaching method when using OER.

If you are educational technology staff at an institution, the institution handbook may be more appropriate for you. There will also be a handbook available for policy-makers such as superintendents and higher education staff. See the Introduction to Other Handbooks in Conclusion for more information.

## NOTES

1. [http://en.wikipedia.org/wiki/Open\\_educational\\_resources](http://en.wikipedia.org/wiki/Open_educational_resources)
2. <http://www.openoffice.org/>
3. <http://www.gimp.org/>
4. <http://www.inkscape.org>



*Image courtesy of "woodleywonderworks" on Flickr*



# Introduction

provide freedom of access for yourself and others

In this chapter

DEFINING OER

WHY OER?

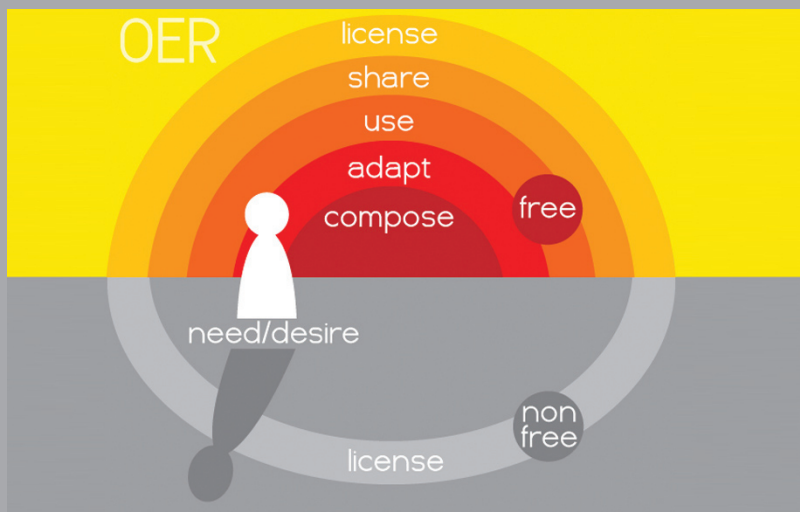
THE COPYRIGHT PARADOX

CONSIDERATIONS

MODELS AND APPROACHES

THE OER LIFE CYCLE

Image courtesy of Sunshine Connelley



# Defining OER

*The purpose of this handbook is to help you use, create, and share “open educational resources” (OER)[1]. Digital technologies, combined with the enablers of our networked society, provide teachers, lecturers and trainers with new and exciting opportunities to rediscover and implement a core value of education, namely to share knowledge freely.*

## DEFINING OER

The term “Open Educational Resource(s)” (OER) refers to educational resources (lesson plans, quizzes, syllabi, instructional modules, simulations, etc.) that are freely available for use, reuse, adaptation, and sharing.

“Open educational resources” was first used in July 2002 during a UNESCO workshop on open courseware in developing countries (Johnstone, 2005). Most definitions of the term include content, software tools, licenses, and best practices. OER is a burgeoning field of practice and exploration as evidenced by the growing number of research studies



including the OECD (2007), OLCOS (2007), and Hewlett Foundation (Atkins, Brown and Hammond, 2007) reports. There is an emerging research community gaining momentum and focusing on investigating the impact of OER on learning and the education environment.

## INSPIRATIONAL OER PROJECTS

There are several inspirational projects mentioned in this handbook. Two have attracted particular attention: Wikipedia on account of its rapid growth and development through vibrant ad hoc communities, and the MIT OpenCourseWare project as one of the pioneers of open courseware.

- *In January 2001, Wikipedia was launched as an online encyclopaedia that anyone could edit.* Most people thought that it would never work. During its first month Wikipedia accumulated 17 articles, by April it had 1,000, in October more than 10,000 and by the end of 2002 it crossed the 100,000 article mark (Zachte, 2008). It is now the largest encyclopaedia in the world and a tremendous resource for students and lecturers.
- *In 2002, the Massachusetts Institute of Technology (MIT) launched its OpenCourseWare project, announcing plans to publish almost all of its course materials online for others to use, modify and share freely.* The world of higher education was in shock. People couldn't believe MIT would give away its "crown jewels" when the rest of the world was trying to commercialize teaching and learning activities. With a combined belief in open access to education and the power of collaboration to improve materials, and with financial support from the William and Flora Hewlett Foundation and the Andrew Mellon Foundation, MIT began to release hundreds of courses to the public. The success has been resounding. To date, MIT has published over 1800 courses online, and they are being accessed by more than one million users every month (MIT OpenCourseWare, n.d.).

Hundreds of similar initiatives (such as WikiEducator[2], OER Commons[3], and Connexions[4]) exist with innovative tools and services to enable sharing and collaborative production of learning resources. These include initiatives focused on:

- ▶ developing royalty free textbooks for primary and secondary schools;
- ▶ simplifying licensing of resources for authors and educators;
- ▶ packaging and indexing educational materials so they are easier to find and use;
- ▶ nurturing online communities for teachers and authors; and
- ▶ growing open education as a field and a movement.

Prominent global players in this arena include the UNESCO, the OECD, the William and Flora Hewlett Foundation and Sun Microsystems who have helped to create a global open education space.

From small (and ambitious) beginnings at MIT with the OpenCourseWare project, the OCW Consortium[5] emerged, and has grown its membership to more than 100 institutions around the world. All are committed to publishing course materials online in a spirit of collaboration and sharing towards a broader vision of quality education for all via access to OER.

The authors of OER can grant users of their materials a variety of permissions, including permission to: modify them, translate or improve them, and share them with others (some licenses restrict modifications and/or commercial use).

## GETTING STARTED WITH OER

While the idea of creating and building open educational resources may seem a little intimidating at first, the best qualifications for doing so are a passion for sharing knowledge and a willingness to learn. As an educator you are the most important contributor to OER, because you understand the needs of students and have expertise in at least

one, if not multiple, fields. Contributors to OER each have different levels of technical, design, and teaching abilities, so don't worry if you don't feel like an expert in every area. In order to grow sufficiently to serve educators and learners around the world, the OER field needs the support of educators like you!

*“A journey of a hundred miles begins with one step.”  
—Ancient Chinese Proverb*

As you embark on this journey and discover a wealth of OER to augment your educational practices, invite peers and colleagues to travel along and share experiences with the community.

This handbook is an OER. Your contributions to the next edition will be most welcome[6].

## NOTES

1. [http://en.wikipedia.org/wiki/Open\\_educational\\_resources](http://en.wikipedia.org/wiki/Open_educational_resources)
2. <http://www.wikieducator.org/>
3. <http://www.oercommons.org/>
4. <http://cnx.org/>
5. <http://ocwconsortium.org/>
6. See *Introduction to the Other Handbooks* in the *Conclusion* chapter.

## SOURCES

Atkins D.E., Brown J.S., Hammond A.L. (2007). A Review of the Open Educational Resources (OER) Movement: Achievements, Challenges, and New Opportunities, Hewlett Foundation. Available online: <http://>

[www.oerdeserves.org/wp-content/uploads/2007/03/a-review-of-the-open-educational-resources-oer-movement\\_final.pdf](http://www.oerdeserves.org/wp-content/uploads/2007/03/a-review-of-the-open-educational-resources-oer-movement_final.pdf).

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OECD Publishing: Pembroke, MA. OLCOS. (2007). Open Educational Practices and Resources. OLCOS Roadmap 2012, Salzburg. Retrieved from <http://www.olcos.org/english/roadmap/>

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Schmidt, P. (2007, November). “3.2 From ODL to Open ODL and Open Educational Resources (OER).” UNESCO OER Toolkit Draft.

WikiEducator. Retrieved March 26, 2008, from [http://www.wikieducator.org/UNESCO\\_OER\\_Toolkit\\_Draft#From\\_ODL\\_to\\_Open\\_ODL\\_and\\_Open\\_Educational\\_Resources\\_.28OER.29](http://www.wikieducator.org/UNESCO_OER_Toolkit_Draft#From_ODL_to_Open_ODL_and_Open_Educational_Resources_.28OER.29)

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# Why OER?

## REFLECTION

*Given the plethora of information which you can easily access on the Internet, consider the following:*

- ▶ *How and why is an OER special?*
- ▶ *Why should you take the time to create or find an OER for use with your students?*

The aim of OER is to improve access to learning opportunities by sharing knowledge and learning resources. By joining this international community of educators, you can save time, cut costs and contribute to improving the quality of learning in your own classroom and around the world. The OER movement seeks to stimulate, facilitate and catalyze growth of the pool of learning resources on the Internet which circumvent barriers to access and lift restrictions on usage[1], thus improving education as a social good. With OER you are free to use, adapt, mix and share the resources, and become part of this growing community.

## USING OER IS SIMPLE AND REWARDING!

With OER you are free to:

- ▶ **Reuse.** Use the work verbatim (unaltered), without having to ask permission.
- ▶ **Revise.** Alter or transform the work to meet your needs
- ▶ **Remix.** Combine the (verbatim or altered) work with other works for enhanced effect
- ▶ **Redistribute.** Share the verbatim, reworked, or remixed work with others. (Wiley, 2007)

Each of these things can be done with traditionally copyrighted material, but requires more effort and resources.

## THE VALUE PROPOSITION FOR OER

With OER you can, for example, browse online photo galleries, select appropriately licensed images, and use them to compose a poster or other learning resource for your own classroom. The result may be shared similarly, as an OER, for others to use in their own learning design without having to ask for permission.

As another example, think about being able to take a song and combine it with video of a local event to create a documentary that can be published online. If the music and video are suitably licensed, this is both possible and legal. It is made possible because people like you take the time to create and share OER.

This OER Handbook is a good example:

- ▶ All the images and fonts have been sourced or adapted from existing images whose license is compatible with

the Handbook's license (Creative Commons Attribution-ShareAlike);

- ▶ Contributors from North America, Africa, Asia and the Pacific region have participated in its development.
- ▶ We have produced the handbook in shorter time frames and at a lower cost when compared to traditional publishing approaches, by saving time and money associated with copyright clearances.

This would not have been possible without remixable resources (text and images), and the free software used to combine them.

The advantages of OER extend beyond remixing existing resources. OER save time, since educators do not need to generate components from scratch. Some OER, especially those which provide complete courses, can compensate for teacher shortages, provided learners are sufficiently self-directed and have enough prior knowledge about the subject. Learners also have the benefit of being able to customize their learning experiences with OER. Finally, some OER can widen access to the work of leading institutions and world renowned teachers. For example, MIT OpenCourseWare[2] offers syllabi from one of the world's top technical institutions and arXiv.org[3] offers access to scientific papers from many of the world's top researchers.

## NOTES

1. The *Licensing* section of the handbook provides more detail on how this is achieved.

2. <http://ocw.mit.edu/>

3. <http://arxiv.org/>

Image courtesy of “kygp” on Flickr



# The Copyright Paradox

*Copyright can be a barrier to sharing knowledge and resources, but it can also be an enabler to achieve the aims and objectives of the OER movement.*

## COPYRIGHT AS BARRIER

There is an abundance of information you can access on the Internet, however in many instances you will not be able to use these materials legally, or without restriction. The challenge lies in partly in *de facto* copyright law. Images, videos, podcasts, and pages that are accessible on the Internet are, more often than not, copyrighted. This means that it may not be legal for you to download them, use them or adapt them for the needs of your students, or redistribute them to your students or other teachers.

The default legal situation in most countries is that the original author holds full copyright on their creations, unless:



- ▶ contracted otherwise by their employment agreement where materials developed at work belong to the employer;
- ▶ the copyright of the work has been handed over to a publisher;
- ▶ in cases where the author declares that the work will be released under public domain. [1]

Full copyright means that you cannot use, adapt or redistribute these materials without the express permission of the copyright holder. Downloading and using an image from a news site without the owner's permission may seem harmless, but it can expose you and your institution to liability. Furthermore, if you plan on sharing your OER with others, most online sites like YouTube and Flickr will remove material from their websites if they receive a copyright or ownership-related complaint. That means all your work may be at risk of being deleted if you incorporate someone else's copyrighted material into your work.

## **COPYRIGHT AS ENABLER**

In contrast, copyright licenses can be used to promote and encourage the sharing and reuse of educational materials. Without copyright law, we could not choose how to license our open educational resources (for example, requiring others to share changes they make to our materials), because a license is only enforceable in the context of copyright law. Under current copyright law, each teacher, lecturer, or trainer is the default copyright holder of the materials they create (unless your institution has an explicit policy stating otherwise). Because you are the copyright holder, you can choose to license your OER in the way that you believe best supports the goals you want to accomplish by sharing your materials.

Because most OER have copyright licenses that are purposefully designed to give you permission to download, alter, and share them, OER provide an exciting opportunity to create and share educational materials in your classroom, with your colleagues, and with the world at large.

## WHAT ABOUT FAIR USE?

Fair use is a doctrine in U.S. copyright law (called Fair dealing<sup>[2]</sup> in most countries outside the U.S.) to allow for select uses of copyrighted material without the copyright holder's consent under certain conditions. Fair use is open to interpretation and there are no definitive rules regarding fair use. Furthermore, the interpretation of fair use (or fair dealing) may differ across jurisdictions, but here are a few ways in which it is typically measured:

1. **The nature of the work.** That means whether or not it is being used for a non-commercial purpose. When something copyrighted is used in a non-commercial way, it is more likely to be considered fair use.
2. **The nature of the copyrighted work.** The more useful something is to the common good, the more likely it will be considered fair use. For example, a paragraph about fire safety tips is less protected than a popular song.
3. **The amount of the work used.** The less you use of a copyrighted material, the more likely it will be considered fair use. As an example, 30 seconds of a movie might be considered fair, while 30 minutes might not.
4. **The effect of the use on the value of the work.** The more the use diminishes the value of the original work, the less likely the use is to be ruled fair use. (U.S. Copyright Office, 2006)

Unfortunately, fair use is often unclear and difficult to determine. For example, while it may be fair use to show a magazine advertisement in your class when teaching a lesson on the social impacts of advertising, it may not be fair use to make a digital copy of the advertisement for a slide show presentation and then upload your teaching resource on a public website.

Copyright laws also vary from country to country, so it is a good idea to know local laws and regulations regarding copyright. Sound complicated? Using OER and bypassing the worry altogether is a good option!

## BUT I'M USING IT IN A CLASSROOM, ISN'T THAT FAIR USE?

Fair use protects many uses in the classroom. The problem comes when you want to share these great materials you've made with others (for example, online). Fair use does not protect you when placing educational materials online, because you're outside your classroom. Because educators are not as protected when sharing online, many opt to put their material on a private site behind a password (perhaps in a system like Moodle[3], Blackboard, or Angel), which in many situations would be considered fair use.

While fair dealing may assist your teaching in the classroom, it is still a barrier to sharing knowledge. Potential audiences, such as family members and others in the community, will not be able to access the materials. There is also the difficulty of administering passwords. Most importantly, creating new lesson materials is time-consuming. Sharing materials brings value to many other educators, but inappropriate licensing can make the legal sharing of educational resources online difficult, if not impossible.

## MORE INFORMATION ON COPYRIGHT

Cornell's Copyright Information Center  
<http://www.copyright.cornell.edu/>

Information on the TEACH Act which updates copyright law with regards to online education  
<http://www.lib.ncsu.edu/scc/legislative/teachkit/>

COL resources on copyright  
<http://www.col.org/colweb/site/pid/3977>

## NOTES

1. Note that public domain is not a legal license—but a declaration to release works as a contribution to the intellectual commons. There are some jurisdictions in which works can not enter the public domain until their copyright expires.

2. [http://en.wikipedia.org/wiki/Fair\\_dealing](http://en.wikipedia.org/wiki/Fair_dealing)

3. <http://www.moodle.org/>

## SOURCES

U.S Copyright Office. (Last Updated 2006, July). Fair Use. Retrieved March 21, 2008, from <http://www.copyright.gov/fls/fl102.html>

Wiley, D. (2007, August). Open education license draft. Iterating Towards Openness. Retrieved August 8, 2008, from <http://opencontent.org/blog/archives/355>



# Considerations

*Open Educational Resources offer some great benefits and opportunities over completely in-house development and/or the purchase of “closed” (traditionally copyrighted) resources:*

- ▶ *OER provide freedom of access for both yourself and others.*
- ▶ *Because you can freely adapt them, OER encourage pedagogical innovation.*
- ▶ *Because OER are available free of charge, using them can lower costs to students and organizations.*
- ▶ *You and your organization may benefit from potential publicity.*
- ▶ *When you share OER, you are contributing to the global education community.*
- ▶ *When you share OER, you open a new method of collaborating with your students and colleagues.*
- ▶ *Your OER may be helpful to future educators.*

- ▶ *Your OER may be beneficial to undeserved individuals in the developed and developing world.*
- ▶ *Using OER puts you in control and avoids “vendor lock-in” or a situation in which you can only use one company’s products.*
- ▶ *OER are represented in standard formats that can be edited and manipulated with free software for a wide variety of reasons including file conversion for access on different media (e.g., on paper, CD/DVD, via mobile devices, in multimedia presentations), re-purposing for various language and educational levels, etc.*

However, when embarking on an OER project, whether it is a small scale attempt to use OER in a course, or a large scale institutional initiative to create and share OER, there are many things to consider:

- ▶ As with Free, Libre and Open Source Software (FLOSS)[1], volunteer contributions are significant, often by a diversity of people with limited time and institutional support.

▶

## AS A USER

- ▶ Check for completeness, appropriateness and quality for your context:
  - ▶ OER developed elsewhere by others may need significant customization to be effective in your local context.
  - ▶ Because OER is generated largely through volunteer work, the topics and types of OER available varies widely. Additionally, quality control is handled differently by each site, with some sites being more selective than others. This occasionally makes the process of finding a quality OER difficult or frustrating.

## AS A PRODUCER

Ensure you have the resources required to compose, adapt, share and use the OER effectively. These may include time, money, talent, knowledge and expertise in learning design and other resources which need to be well coordinated.

- ▶ Get support from the administration of your institution.
- ▶ For larger initiatives, invest in the necessary resources to support the initiative including:
  - » Startup funds
  - » Technical support to manage servers, including appropriate security, privacy, protection from vandalism and spam, etc.
  - » A small team to manage quality and check legality (copyright, accessibility and other requirements) of resources before approving for publishing.
  - » Marketing and communications.
- ▶ The Handbook for Institutions has more comprehensive guidance for large scale institutional OER initiatives.
- ▶ Reward contributors.
- ▶ OER typically requires Internet access (ideally high-speed). If not available, some resources are not usable and participation may be limited.
- ▶ Technical requirements for using OER vary. Some may require you to use a particular piece of software.
- ▶ If you want to include “closed” material in your OER, obtaining copyright clearance from the owner can be difficult and expensive.
- ▶ Your institution may be concerned about ‘giving away’ educational materials created by you and other employees,

and policy makers may not embrace the use of OER. It is recommended that they read the handbook for Policymakers [2].

A significant OER consideration is the current state of copyright. The next section will discuss how copyright influences OER.

## NOTES

1. See *Models and Approaches* as well as the *Glossary* in the *Appendices* chapter for more information.
2. See *Introduction to Other Handbooks* in the *Conclusion* chapter.

## SOURCES

Baker, J. (Last Edited 2007, June 20). *OER Introduction. Connexions*

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Image courtesy of “Spigoo” on Flickr



Image courtesy of “Deivis” on Flickr



# Models and Approaches

*Approaches to developing OER vary in terms of the degree of control required according to the nature of the OER initiative, the types of resources to be produced, the time and other resources available, and the management styles of the people involved.*

## THE CATHEDRAL AND THE BAZAAR

The “cathedral and bazaar” metaphor is used to describe two extremes.

In 1997, programmer, author, and open source advocate Eric S. Raymond wrote an essay entitled “The Cathedral and the Bazaar.” The essay uses an analogy to compare two different software development methodologies. The “cathedral” refers to the traditional engineering approach, and the “bazaar” refers to the “open source” approach. When a cathedral is built, the church oversees the workers who each

build a piece of the cathedral according to a master plan. One group, management, oversees the programmers who each build pieces of the program according to the plan. In the bazaar, there is no single group who is in charge. Each person can barter and take parts from anyone else in the market. In the open source model of software development, anyone can start a project. Although most projects have special requirements before code is accepted, virtually every project is willing to accept help in some way. Additionally, assuming the software licenses are compatible, code developed for one project can be used with other projects (Raymond, 2000). Of course, not every project fits strictly in a ‘cathedral’ or ‘bazaar’ model, with some bazaar-like projects taking more direction from an oversight group than others.

The term “open source” refers to “open source software”: software (or programs) whose source code (the human-readable instructions defining the software’s behavior) is available. With closed source software, the only people who are allowed to look at and change the source code are the developers and owners of the software. In contrast, anyone may look at the source code of open source software and make changes to it. Some corporations sponsor open source initiatives, but many projects are started and maintained entirely by volunteers. Although open source software has been around since the 1960’s, it has only in the last decade that it has come into the mainstream (Raymond, 2000; Gonzalez-Barahona, 2000; Paul, 2006). Probably the most prominent example of open source software is the GNU/GNU/Linux operating system[1] GNU/GNU/Linux is available in many different customizations, known as “distributions,” each designed according to the preferences of their communities of users and developers (see DistroWatch[2]).

Although GNU/GNU/Linux has not been adopted widely in home use, it has been used extensively on the server side (e.g., for running web servers, databases, mail servers, networking facilities, etc., Acohido, 2002).

## AN EXAMPLE OF EACH MODEL

### Cathedral: the Windows®[3] operating system

Windows® is developed by Microsoft with a large team of programmers. Each programmer works on a specific part of the operating system until it is completed and that part is added to the whole. Development of the operating system is elaborately planned and development largely follows that plan.

### Bazaar: the GNU Image Manipulation Program (GIMP[4])

GIMP is an image and photo-editing program, somewhat similar to Photoshop. It was created by volunteers and supported by donations. Programmers and users from a variety of industries participate in its development by reporting bugs, contributing code, testing for software bugs and writing documentation. Others contribute plug-ins that give extra functions to the GIMP (special filters, file format conversion, etc.). Some members of this community did not like the GIMP's appearance and created their own project with the GIMP's source code called Gimpshop[5], which looks more similar to Photoshop. Meanwhile, development still continues on GIMP.

Open source programs, whose development follows the bazaar model, are valuable to OER because of their adaptability and freedom. Open source programs tend to support open formats better because anyone can view the program code, and they are easier to modify and change to meet new circumstances. Most open source programs are too complicated for the average person, or even those with basic programming skills, to modify and change, but many find reassurance in knowing that at least open source software could be changed legally without having to obtain permission or pay a fee. Some in the OER community like to support open source programs because they see philosophical parallels between goals of OER and open source programs. Open source programs will be discussed in greater detail in

the *Compose* chapter.

The open source “bazaar” approach to developing software is regarded as superior to that of the closed source “cathedral” approach by many people. The benefits include having a broader community involved, many eyes viewing the code to spot bugs and design improvements, etc. A question often debated in the OER community is the extent to which these benefits may be applicable for OER development. Some projects, such as a university OpenCourseWare, are run by an institution and participation in development is generally limited to members of that institution, making it somewhat like a “cathedral” model. In contrast, projects like Wikipedia and Wikiversity are closer to the “bazaar” model, as they accept contributions from anyone, even if the contributor remains anonymous.

In general, the degree of control required will depend on the nature of the project. Large projects tend to require more structure and tighter management, especially if there are time constraints that must be met. But there are other factors such as the inherent modularity and granularity of components, criticality of accuracy, team composition, etc., that factor into decisions about control as well.

There are prominent OER projects using both the “bazaar” and “cathedral” models, and this handbook is designed to help educators new to the OER world navigate both.

## CONSUMERS AS PRODUCERS

In addition to deciding on a methodology for OER development, it is important to understand the possible interactions among learners and educators during the process. The simplest case is an educator independently developing an OER for a particular class with no prior interaction. The process seldom ends there if the resource is subsequently shared, and the interactions may become quite rich and rewarding. For example, educators collaborating to develop OER for educators or for learners, learners collaborating to learn or to develop their own learning resources (and share them), learners and educators collaborating to learn and in the process produce OER for educators and

for learners. The types of OER produced vary from curricula, lecture-based and other forms of didactic learning resources for educators, to images, text, video, podcasts and screencasts by and for both educators and learners. These types of OER can be easy to produce and simple to distribute.

On the other hand, some OER may be more open-ended and difficult to produce (e.g., interactive simulations) or control, with a potential for taking on a life of their own (discussion forums, wikis, blogs, and use of various social sites such as Facebook, Wikispaces, Flickr, YouTube, Second Life, etc.).

The rise of OER is challenging the pedagogy field as it opens up almost limitless possibilities for collaboration and meaningful partnerships between teachers and learners in co-designing and co-creating learning materials and activities.

## NOTES

1. Sometimes GNU/GNU/Linux is referred to simply as “GNU/Linux.” The difference has to do with issues of attribution and how the term has been used over time. This handbook will use GNU/GNU/Linux, but you should be aware that this use of the term, while technically more correct, is not universal.

2. <http://distrowatch.com/>

3. Windows® is a trademark of Microsoft Corp.

4. <http://www.gimp.org/>

5. <http://www.gimpshop.com/>

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# OER Life Cycle

*The OER life cycle begins with a desire or need to learn or teach something.*

The following sequence of steps illustrates a typical development process.

1. **Find.** Start by looking for suitable resources which contribute to meeting the need or satisfying the desire. This may include using general search engines, searching specific repositories and finding individual websites. Some potential components may be available offline, including last year’s lecture notes, class projects, handouts for learners and other resources prepared previously.
2. **Compose.** With a collection of resources at your disposal, start piecing them together to form a learning resource for yourself, your fellow educators and/or learners. This is a creative design process of building an educational resource from scratch and/or using components you have found.
3. **Adapt.** While composing OER, it will nearly always be necessary to adapt components to your local context. This

may involve minor corrections and improvements, remixing components, localization and even complete rework for use in diverse contexts.

**4. Use.** The actual use of OER in the classroom, online, during informal learning activities, etc.

**5. Share.** Once an OER is finished, make it available for the open education community to re-use and begin the life cycle again.

## LICENSING ALSO PLAYS A ROLE THROUGHOUT THE LIFE CYCLE.

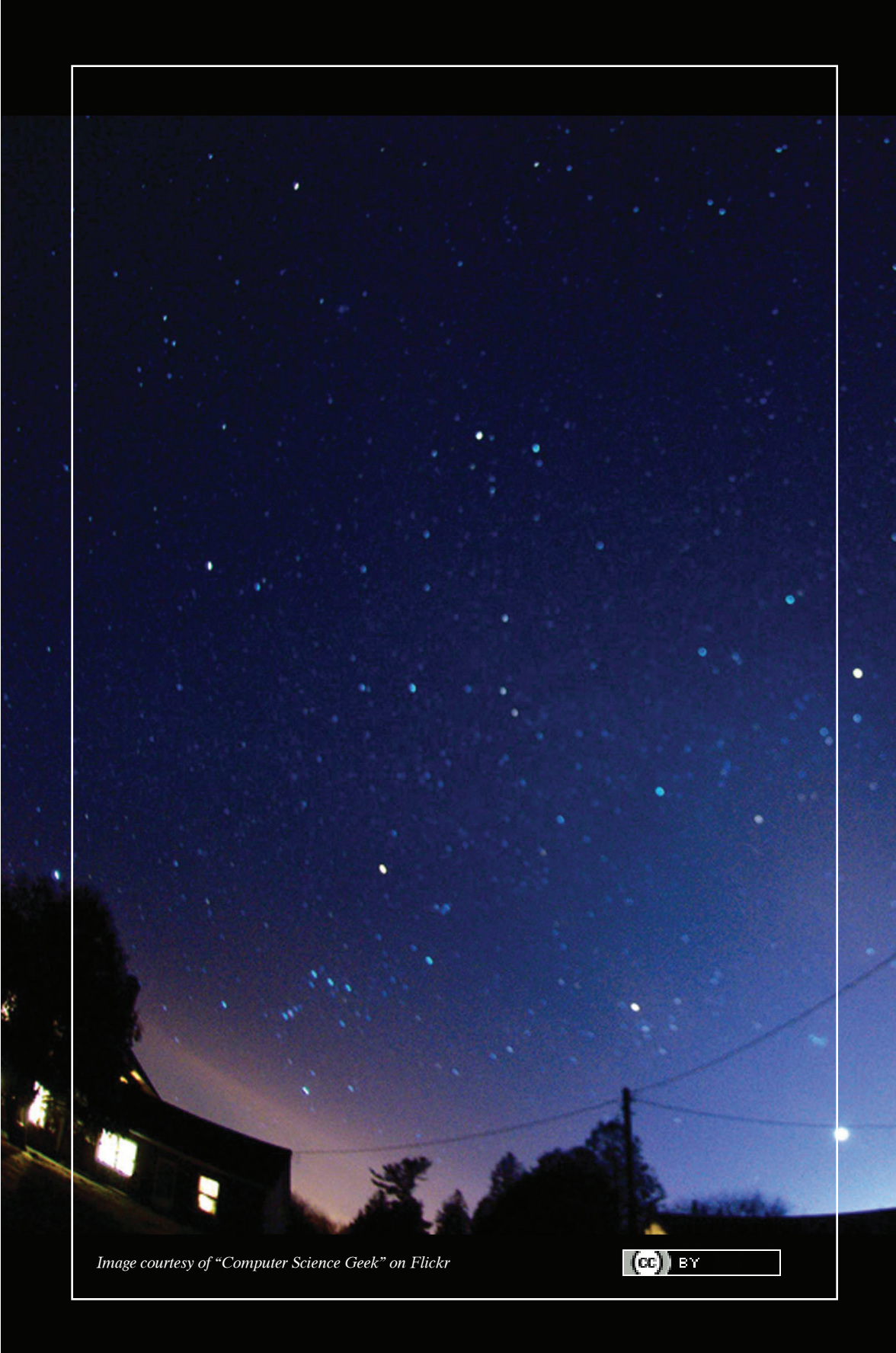
As with all instructional or learning design, each step requires attention to the purpose of the learning resource, its role in the learning process, quality, and accessibility. You should also carefully consider issues of file format, mode of access, and licensing of the components. Each step could involve some degree of collaboration. Where applicable, open source tools are available to support all of these activities.

This life cycle applies to the development of an individual OER as well as large OER projects. Each of these stages have their own unique considerations. Although the life cycle follows a logical progression, it is not necessarily followed sequentially in practice. Some parts, such as adaptation, can be done simultaneously with other parts or out of order.

This handbook is organized around the OER life cycle. Each section will guide you through the individual stages of working with OER. The sections will make the most sense when read in order, although this is not required. Feel free to refer to any other part of this *OER Handbook* at any time.



*Space for Personal Notes*



*Image courtesy of "Computer Science Geek" on Flickr*



# Find

where to find open educational resources

In this chapter

FIND YOUR OWN RESOURCES  
SEARCH ENGINES  
GENERAL REPOSITORIES  
SCIENCE REPOSITORIES  
SOCIAL SCIENCE REPOSITORIES  
HUMANITIES REPOSITORIES  
OPEN TEXTBOOKS  
INDIVIDUAL PROJECT SITES  
FILE FORMATS  
ACCESSIBILITY  
PERSPECTIVES



## Find

As stated in the introduction, one of the four “Rs” is “Reuse.” This section will show you where to find these resources as well as ones that can be localized or remixed (see the Adapt chapter). The various sections are presented in an order deemed most efficient with state of the art search engines and OER repositories as they are today (mid-2008). However, you may be drawn to a particular sub-section and find what you need just as efficiently.

Start with a general search engine and some carefully chosen keywords (e.g. high school, biology, photosynthesis). If you need to search further, try some of the general OER repositories, and finally the relevant theme-based repositories, or individual project sites. If entire text books (or extracts) are required, start with the *Open Textbooks* section. Search for quality, and have confidence in your own ability to judge how useful the resource looks for you and your learners.

### SOURCE

Schmidt, P. (2007, November). “7.1 Searching and finding OERs.” UNESCO OER Toolkit draft. WikiEducator. Retrieved March 21, 2008, from [http://www.wikieducator.org/UNESCO\\_OER\\_Toolkit\\_Draft#Searching\\_and\\_finding\\_OERs](http://www.wikieducator.org/UNESCO_OER_Toolkit_Draft#Searching_and_finding_OERs)



# Find Your Own Resources

Before venturing out and surfing the ocean of educational resources on the Internet, take a good look around at home and at the office for existing lesson plans, visual aids, handouts, and multimedia resources developed over the years and stored on backup disks or in folders, desk drawers, or filing cabinets. These resources have the advantage of having been designed for the context in which they were to be used, and some may have stood the test of time in the classroom. The resources found may meet the need, or they may be the beginning of an open educational resource. The next step is to find additional resources to expand and complete the needed resource.

Consider releasing your own resources under a license that is compatible with the Free Cultural Works Definition[1] (See *Which License Should I Choose?* in the *License* chapter) and redistributing them as OER for other teachers, either through self-publishing or third-party services. To

learn more about how to share your resources, see the section later in the Handbook that describes the differences between publishing OER yourself versus using a third-party publishing service, and then dig into more detail with either option through the *self-publishing* or *third-party publishing* sections in the *Share* chapter.

After evaluating your own materials, if you still need additional resources, those found through search engines can be used to complete your project.

## NOTES

1. <http://freedomdefined.org/Definition>





# Search Engines

A number of specialized search engines and services have been set up to make finding OER easier. If your aim is to find resources to combine and mix with your own and with each other, it is important to understand the licensing implications[1]. Each search engine has different strengths and may not provide the accuracy and speed of standard web searches. The list is constantly growing, but some examples include:

ADRIANE Search and Indexation Tool[2]: Search among several prominent OER repositories including MERLOT[3], OER Commons[4] and ADRIANE[5].

CREATIVE COMMONS SEARCH[6]: offers license-aware search through Creative Commons enabled services of Google, Yahoo, Flickr, blip.tv, etc.. The search results will only include resources that are licensed under a Creative Commons license which matches your requirements (e.g. resources which may be modified and used commercially).

COMMONWEALTH OF LEARNING (COL) KNOWLEDGE FINDER[7]: used to be

its own unique search engine, but was recently replaced by a set of specialized Google searches, one of which focuses on open educational resources. This means that the CoL has created a list of websites they consider good sources for OER, and your search will be restricted to that set of websites.

FEDERAL RESOURCES FOR EDUCATIONAL EXCELLENCE (FREE)[8]: learning resources from government agencies. Licenses tend to be either traditional copyright or public domain.

LEARNING OBJECTS.NET[9] a website that collects links to OER, but does not actually store any itself. Over 250 links, with updates on OCW and wiki sites. License varies.

OPENCOURSEWARE FINDER[10]: developed by the Center for Open and Sustainable Learning (COSL) at Utah State University, collects a list of courses from some of the well-known OpenCourseWare sites, and organizes them taxonomically. It offers an efficient service with a clean user-interface, but new resources (or new sites) do not show up immediately. The emphasis is on MIT OCW material.

OER RECOMMENDER[11]: a simple search engine that returns results from several different repositories. A browser extension is available which can recommend learning resources for any page you visit.

OER COMMONS[12]: developed and hosted by the Institute for the Study of Knowledge Management (ISKME) in Education and funded by the Hewlett Foundation, this large database of OER includes resources for K-12 and higher education. It also includes features such as tagging, ratings, comments, reviews, and social networking.

UNIVERSAL EDUCATION SEARCH[13]: While not operational yet, expectations are high that the recently announced specialized search engine developed by Google and the Creative Commons ccLearn[14] project with support from the Hewlett Foundation will improve things considerably. The key difference compared to a general Google search is that the project is currently collecting URLs from OER repositories. In the meanwhile, Creative Commons has its own list of OER search engines[15].



TECHXTRA[16]: find articles, key websites, books, the latest industry news, job announcements, ejournals, eprints, and technical reports.

## EFFECTIVE SEARCH WITH SEARCH ENGINES

If you are already familiar with different search engines and BOOLEAN search you can skip this section.

For a normal search simply enter one or more keywords or a phrase into the search box of your favorite search engine and click on the “search” button for the results. Most search facilities offer “boolean” capabilities which permit the use of special keywords (e.g. “and”, “or”, “not”) or symbols (e.g. “+”, “-”, “:”) to refine a search. You can use the same methods and techniques as you would for a general search.

Boolean search is a type of search that uses words to establish the relationship between search terms. There are three Boolean operators:

**AND:** Use the AND operator to retrieve a set in which each citation contains all the search terms. This operator places no condition on where the terms are found in relation to one another; the terms simply have to appear somewhere in the same citation.

**OR:** Use the OR operator to retrieve documents that contain at least one of the specified search terms. Use OR when you want to pull together articles on similar subjects.

**NOT:** Use the NOT operator to exclude the retrieval of terms from your search.

For example, if you wanted to search for the fruit “apple”, you could exclude all results which also refer to “computers” and “macintosh” with a request like:

apple AND fruit NOT macintosh NOT mac NOT computer

Every search engine has its own rules, but nearly all of the major search engines understand the following request:

: apple +fruit -macintosh -mac -computer

If you are looking for a phrase, you should set the phrase in quotation marks. If you are looking for a “big apple” plant and are not interested in New York - which is often called “big apple” you could write:

: “big apple” -”New York”

The colons (“:”) used in the search examples are meant to give greater weight to one of the search terms over the others. For example “:Apple+fruit” would have the search results ranked differently than “:fruit+apple.”

## NOTES

1. See *Licensing* and specifically *Which License Should I Choose?* and *License Compatibility*.
2. <http://ariadne.cs.kuleuven.be/silo2006/NewFederatedQuery.do>
3. <http://www.merlot.org/merlot/index.htm>
4. <http://www.oercommons.org/>
5. <http://ariadne.cs.kuleuven.be/silo2006/FederatedQuerySubmit.do>
6. <http://search.creativecommons.org/>
7. <http://www.col.org/colweb/site/pid/2919>
8. <http://www.free.ed.gov/index.cfm>
9. <http://www.learning-objects.net/index.php>
10. <http://ocwfinder.com/>
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15. <http://learn.creativecommons.org/education-search-engines/>
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# General Repositories

A number of institutional OER projects stand out for the volume and quality of resources they have published. One starting point is the list of OpenCourseWare Consortium members with active repositories that is provided on the OCWC site [1]. The MIT OpenCourseWare project [2] deserves special mention since it was the first large scale OpenCourseWare endeavor and has produced over 1800 courses so far. The materials are not designed for online learning, however, but rather as instructor resources, and often the important reading materials are not available as open or online resources. The Open University UK[3] takes a different approach to OpenCourseWare and publishes materials specifically designed for online learning, but only offers some modules within its full courses freely.

Repositories of training and educational materials offer a range of resources developed by many different organizations and individuals for different subjects, educational levels, and purposes. This handbook has divided the list of general repositories into general licensing categories. These license categories are arranged from least to most restrictive. Traditionally copyrighted sites can only be viewed and used in the classroom, with no option to localize and remix and have been placed in the appendix. They are included in this handbook because they might be useful to readers and not necessarily because they epitomize OER.

Most repositories operate under a variety of licenses, so you should check the license of the individual object before use [4].

## PUBLIC DOMAIN

### *The Internet Archive*

The Internet Archive is a collection of images, audio and video that are in the public domain. The Internet Archive particularly specializes in media that is over thirty years old. It also has section especially for education. Users can rate and review OER within the archive. Public domain, with some Creative Commons licensed materials. <http://archive.org>

### *Itrainonline*

Itrainonline aims to be a set of training materials. Most of the resources are licensed as free and open content, but the licenses are often contained in separate files, which have to be downloaded. Sometimes that can make it more difficult to determine if a resource can be freely used. Itrainonline organizes resource in subject areas, and offers a site search. Website allows the material to be reproduced, translated, and disseminated without restriction. <http://www.itrainonline.org>

### *Open Clip Art Library*

Collection of clip art over a wide variety of subjects. Files are in SVG format (see File Formats for more information). Any text on the website is licensed CC-BY, but the clip art is public domain. <http://openclipart.org/>

### *Project Gutenberg*

Project Gutenberg is a collection of books that are in the public domain. Titles include *Pride and Prejudice*, *The Adventures of Tom Sawyer*, and *The Poetics of Aristotle*. The books are available in several formats, but usually lack any illustrations. Some audiobooks are available (often of more popular titles). All books are in the public domain.

[http://www.gutenberg.org/wiki/Main\\_Page](http://www.gutenberg.org/wiki/Main_Page)

## CC-BY

### *Connexions*

Connexions is an online repository and collaboration portal for OERs. Connexions consists of a series of learning objects, called modules, that can be used individually or combined to form collections such as web courses and textbooks. All users are invited to submit new content or build on existing content. Users can search and sort by subject, language, popularity, or title/author. A system of “lenses” enables individuals and organizations to direct users to those materials that they have reviewed and found to be of high quality. Organizations like Rice University Press are using Connexions as their digital backend to not only open up access to their publication catalogs but also lower their operational costs. The repository currently contains 5193 modules and 319 collections, of which 10 are available as low-cost print-on-demand (with more to come) as of April 2008. CC-BY. <http://www.cnx.org>

### *Curriki*

Curriki allows users upload educational resources as well as provide ratings and comments. It has recently been launched and does not offer the amount of materials other sites feature, but is growing. CC-BY, unless indicated otherwise. <http://www.curriki.org>

## CC-BY-SA

### *Citizendium*

Citizendium is somewhat similar to Wikipedia. All articles are licensed Creative Commons BY-SA, as opposed to the GFDL used by Wikipedia. However, in order to contribute to Citizendium you must use your real

name and provide proof of expertise. CC-BY-SA, except for original Wikipedia articles, which are GFDL.

[http://en.citizendium.org/wiki/Main\\_Page](http://en.citizendium.org/wiki/Main_Page)

### *IIEP-UNESCO Wiki of OER repositories*

UNESCO/IIEP hosts a Wiki that offers a list of several portals, gateways and repositories. It offers a list of links to OER initiatives, resources and tools. It was compiled following the first IIEP discussion forum on Open Educational Resources (24 October - 2 December 2005). It offers access to a selection of approx. 30 repositories of open learning objects, mostly at the university level. CC-BY-SA.

<http://oerwiki.iiep-unesco.org/index.php?title=Repositories>

### *Kaltura*

Kaltura is a video-sharing site that is similar to YouTube and TeacherTube, but the videos are licensed CC-BY-SA. Visitors can upload a video and allow anyone edit or add footage to a video. The editing options can be password protected, so editing can be restricted to a class. <http://www.kaltura.com>

### *LeMill*

Web community for finding, authoring and sharing open and free learning resources and open source server software for setting up and having your own LeMill site. Design is by and for school teachers. LeMill has 1126 learning objects with more being added daily. Mostly CC-BY-SA. <http://www.lemill.net>

### *Qedoc*

Qedoc specialises in interactive open educational resources. It provides software tools for the creation and playback of resources, and for the conversion of resources into formats which other systems (such as Moodle) can use. It also hosts a MediaWiki-driven repository of open educational resources created with Qedoc tools. The repository also

allows for community discussion of the use and development of new resources. Qedoc has 350 interactive resources published. CC-BY-SA. [http://www.qedoc.org/en/index.php?title=Main\\_Page](http://www.qedoc.org/en/index.php?title=Main_Page)

### *WikiEducator*

WikiEducator is a project funded by the Commonwealth of Learning (CoL) with headquarters in Vancouver, Canada. The site is specifically for developing free content for use in schools, polytechnics, universities, vocational education institutions and informal education settings. However, OER at WikiEducator may or may not be formatted as a course. The topics range widely, including subjects such as Anatomy and Life Skills. As with Wikipedia and Wikiversity, anyone can edit WikiEducator OER; therefore, it is necessary to review WikiEducator information before use. CC-BY-SA. <http://www.wikieducator.org>

### **GFDL**

#### *Wikipedia*

Wikipedia is one of the most recognized sources of OER. Wikipedia is an encyclopedia in which anyone can edit. With over nine million pages in several different languages, there's a Wikipedia entry on virtually any subject. While Wikipedia's editors try to verify the information added to Wikipedia, errors can and do appear. Therefore, it is important to carefully examine Wikipedia content before use. Other wiki projects that are useful for OER is Wikibooks, which has a collection of freely available books and Wikimedia Commons, a collection of images, audio and video. GFDL license. [http://en.wikipedia.org/wiki/Main\\_Page](http://en.wikipedia.org/wiki/Main_Page)

#### *Wikiversity*

Sponsored by the same foundation as Wikipedia, Wikiversity organizes its content according to courses. As with Wikipedia, anyone can edit Wikiversity courses. The courses are arranged by subject, allowing for easy navigation. Since everyone can edit a Wikiversity page, it is important to carefully examine Wikiversity content before use. GFDL license. <http://en.wikiversity.org/wiki/Wikiversity>

## CC-BY-NC OR CC-BY-ND

### *ccMixer*

ccMixer offers songs under a Creative Commons license. Several labels allow the reuse of their music, the search term “open music” leads to many results. The podcasting world has a need for open music and there is a growing site with so-called “podsafes” music, or music that has been licensed in a way friendly to podcasts. CC-BY-NC. <http://ccmixter.org/>

### *The Freesound Project*

Freesound is a platform for Creative Commons licensed sounds. There are no songs available on this website just sounds and noises.

CC-BY-ND. <http://freesound.iua.upf.edu/>

## CC-BY-NC-SA

### *LabSpace*

The LabSpace is the experimental zone of OpenLearn institutional repository of the Open University from UK. The resources are from several subjects: Arts and History, Business and Management, Education, Health and Lifestyle, IT and Computing, Mathematics and Statistics, Modern Languages, Science and Nature, Society, Study Skills, and Technology. Around 100 resources. CC-BY-NC-SA.

<http://labspace.open.ac.uk/>

### *MIT OpenCourseWare*

MIT OCW is a large-scale, Web-based electronic publishing initiative funded jointly by the William and Flora Hewlett Foundation, the Andrew W. Mellon Foundation, Massachusetts Institute of Technology (MIT), and generous support of the Ab Initio software company.

Its goals are to: (i) Provide free, searchable access to MIT’s course materials for educators, students, and self-learners around the world, and (ii) Extend the reach and impact of MIT OCW and the “OpenCourseWare” concept. In March 2006 there were 1,400 courses.



OpenCourseWare materials are licensed by the Massachusetts Institute of Technology under a Creative Commons License (CC 2.5). It offers course materials of all subjects done at the university. It also provides access to video recorded classes. CC-BY-NC-SA.

<http://ocw.mit.edu/OcwWeb/search/AdvancedSearch.htm>

### *OpenLearn*

The Open University's (UK) OpenLearn website with free and open educational resources for learners and educators around the world. In the LabSpace one can share and reuse educational resources, which means you are allowed to modify and re-use (see LabSpace listing). OpenLearn is supported by The William and Flora Hewlett Foundation. The resources are from several subjects: Arts and History, Business and Management, Education, Health and Lifestyle, IT and Computing, Mathematics and Statistics, Modern Languages, Science and Nature, Society, Study Skills, and Technology. OpenLearn is planning to increase the number of study units available in the LearningSpace between now and April 2008. An estimated 5400 learning hours of material. CC-BY-NC-SA. <http://openlearn.open.ac.uk/>

## VARIOUS

### *Flickr*

Flickr is a photo sharing site with some photos licensed using a Creative Commons license[5]. There are two ways to search for Flickr photos with a Creative Commons license is to go to Flickr's Creative Commons page. Another method is to go to <http://www.flickr.com/search/advanced>. Select "Only search within Creative Commons-licensed photos." In some situations you may want to add a checkmark by "Find content to use commercially" and "Find content to modify, adapt, or build upon." As the option might imply, "find content to use commercially" means those photos can be used for commercial projects, such as books and magazines. Photos used from Flickr should be used 'as-is,' without any modification. However, if you've selected "Find content to modify, adapt, or build upon," then those photos can be localized to fit a particular need[6]. License varies, from All rights reserved to any one of several Creative Commons licenses. <http://www.flickr.com/>

### *MERLOT*

MERLOT (Multimedia Educational Resources for Learning and Online Teaching) is provided by the California State University Center for Distributed Learning. It is a clearing house for learning and teaching resources, and allows users to assess the quality of the materials, in the same way Amazon users can post reviews and comments about books. In an informal study, many of the resources found were in fact not open educational resources, but copyrighted. MERLOT lists 17741 resources, searchable by discipline or keyword. License varies, see their acceptable use policy. <http://www.merlot.org/merlot/index.htm>

### *Learn Out Loud*

Audiobook retailer with a selection of free podcasts and video. Licenses vary, but includes some that are fully copyrighted or in the public domain. <http://www.learnoutloud.com/Free-Audio-Video>

### *Open Courseware Directory (OCD)*

Seven groups of subject-specific OpenCourseWare; also specialized resources for each subject. It is an annotated listing of publicly available courseware (lecture notes, handouts, slides, tutorial material, exam questions, quizzes, videos, demonstrations, etc) from the world's universities, colleges and other educational institutions. It was created and is maintained by iberry.com, a non-profit private website, serving the international academic community. License varies. <http://iberry.com/>

### *World Lecture Project*

A directory with links to audio and video lectures from academics around the world, created by a group of freelance academics from Berlin, Germany. Registered users may add content and edit lecture descriptions. The site will also soon host forums for those involved in science and teaching. 749 lectures. License varies. <http://www.world-lecture-project.org/>

## NOTES

1. <http://www.ocwconsortium.org/use/index.html>
2. <http://ocw.mit.edu>
3. <http://openlearn.open.ac.uk>
4. See the *Licensing* chapter for more information about licenses.
5. See the *Licensing* chapter for more information about Creative Commons licensing.
6. See *Licensing* and *Adapt* chapters for more information.

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Repositories. (2008, February 13). OER Wiki. Retrieved April 2, 2008, from <http://oerwiki.iiep-unesco.org/index.php?title=Repositories>

Image courtesy of “Major Nelson” on Flickr



# Science Repositories

Over time more science repositories have adopted open licenses. Science repositories with traditional copyright can be found in the *appendix*.

## CC-BY-SA

*ADUni.org*

Website of the alumni of ArsDigita University (ADU), a one-year, intensive post-baccalaureate program in Computer Science based on the undergraduate course of study at MIT. The program was forced to shut down in 2001, but the course materials are available on the site for free use. ADUni.org has 13 computer science courses, available under a CC-BY-SA license. <http://aduni.org/courses/>

## GFDL OR GPL

### *PhET (Physics Education Technology)*

A suite of Java and Flash simulations for teaching and learning physics from the Physics Education Technology project of the University of Colorado. The simulations are animated, interactive and game-like environments in which students learn through exploration. They emphasise the connections between real life phenomena and the underlying science and seek to make the visual and conceptual models of expert physicists accessible to students. Findings from prior research and student testing are incorporated into the design. The simulations run directly from the website. Users can also download and install the entire website on to any their computer for use offline. A guide details how the simulations can be best used to support both in-class teaching and individual learning. Simulations are also available in Spanish. PhET has 49 simulations for physics education. All rights Reserved.

<http://phet.colorado.edu/new/index.php>

## CC-BY-NC-ND

### *Physclips: Mechanics with animations and video film clips*

Kinematics and dynamics are presented here in multimedia, at introductory and also at deeper levels. Individual video clips and animations are suitable for use by teachers, while students may use the whole package for self instruction or for reference. Animations from Physclips require the Flash 6 Plugin. The multimedia modules have animations and film clips and are typically 3-5 Mb. The much smaller HTML versions have only text and images. If your connection is slow, you might read some of the background links while the modules load.

## VARIOUS

### *HEAL (Health Education Assets Library)*

Part of the US National Science Foundation's National Science Digital Library Project, the goal of the project is to create a collection of digital teaching and learning resources for medical students and professionals. Users can search the main "Reviewed Collection," a collection of

materials awaiting review and 12 affiliated collections. Users can submit materials for review and possible inclusion in the main collection. HEAL is hosted by the University of Utah, UCLA and the University of Oklahoma. 21,834 resources. Most CC-BY-NC-SA.  
*<http://www.healcentral.org/>*

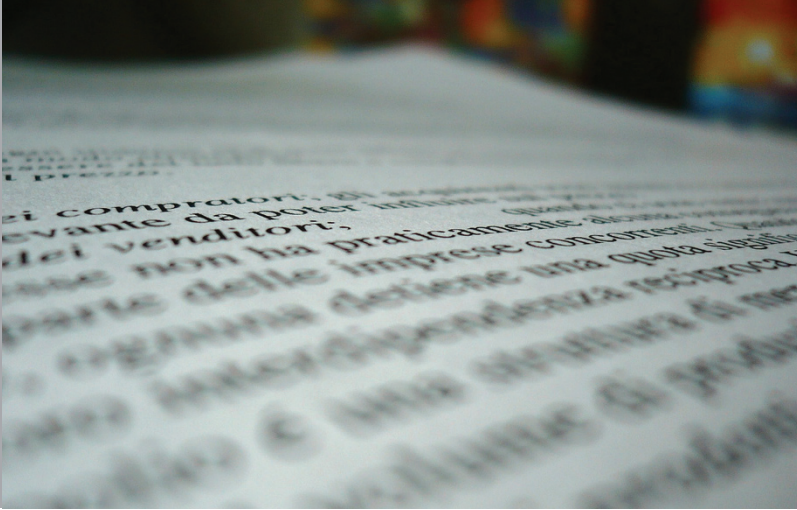
#### *Intute: Health and Life Sciences*

A free online service providing access to the very best web resources for education and research, evaluated and selected by a network of subject specialists in the health and life sciences. Over 31,000 resources. License varies. *<http://www.intute.ac.uk/healthandlifesciences/>*

## SOURCES

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# Social Science Repositories

*Fully copyrighted social science repositories can be found in the appendix.*

## CC-BY-NC-SA

### *Fulbright Economics Teaching Program OpenCourseWare*

Fulbright Economics Teaching Program OCW will provide access to course materials (syllabi, lecture notes, reading lists, problem sets etc.) in English and Vietnamese for all FETP courses. FETP is a partnership of the University of Economics, Ho Chi Minh City and the John F. Kennedy School of Government at Harvard University. Fulbright's OCW contains 37 economics courses, available under a Creative Commons FETP License (CC-BY-NC-SA). <http://ocw.fetp.edu.vn/home.cfm>

## VARIOUS

### *Intute: Social Sciences gateway*

A free online service providing access to the very best Web resources for education and research, evaluated and selected by a network of subject specialists in the social sciences fields. Each subject area within Intute has its own collection development policy (available on request). Only covers information relevant to social science HE and FE students, academics, researchers and practitioners. The social sciences are broadly defined, as well as core subjects the gateway covers areas such as law, business, hospitality, sports and tourism. License varies.

*<http://www.intute.ac.uk/socialsciences/>*

## SOURCE

Exemplary Collection of Open eLearning Content Repositories. (2007, February 1). WikiEducator. Retrieved March 21, 2008, [http://wikieducator.org/Exemplary\\_Collection\\_of\\_Open\\_eLearning\\_Content\\_Repositories#Social\\_Sciences](http://wikieducator.org/Exemplary_Collection_of_Open_eLearning_Content_Repositories#Social_Sciences)





# Humanities Repositories

The humanities cover a wide range of disciplines and the Internet is not short of related pages. However, for this edition of the handbook only a few repositories dedicated to humanities were found. The few we did find, mostly music-related, are listed below. For humanities topics besides music, please see the *General Repositories* section. Sites such as Wikipedia, Connexions and Wikiversity have humanities sections that cover a broad range of topics.

## PUBLIC DOMAIN

*Gutenberg: The Sheet Music Project*

Sheet music from classical composers. Sheet music available in XML format. See *File Formats* in the *Appendices* for more details.

### *LibriVox*

LibriVox volunteers record chapters of books in the public domain and release the audio files back onto the net. Their goal is to make all public domain (under U.S. right) books available as free audio books. It is a volunteer, open source, free content, public domain project. LibriVox currently has 1268 recordings. <http://librivox.org/>

### CC-BY-NC-ND

#### *Berklee Shares*

An electronic publishing initiative of Berklee College of Music. Berklee Shares' goal is to provide free access to faculty-authored Berklee music lessons designed for musicians, music students and music educators. The lessons are available for downloading, listening, viewing or reading. Music lessons for 5 topics and 8 instruments, available under a CC-BY-NC-ND license. <http://www.berkleeshares.com/>

### VARIOUS

#### *FreeSheetMusic*

Distribution of more than 360,000 free sheets of music. They are in different formats: PDF, GIF, JPEG, etc. There are thousands of pieces. Visitors can upload music sheets. The sheets are organized by genre, instrument or compositor. They also provide links to other sites with free sheets. License varies. <http://www.freesheetmusic.net>

#### *Jamendo*

Creative Commons licensed music by artists from around the world. The exact Creative Commons license varies, but some allow for remixing. Songs are in MP3 format and albums in ZIP. Users can rate music and receive recommendations. Currently over 10,000 albums. <http://www.jamendo.com/en/>

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OER Development and Publishing Initiatives. (2008, February 28). *OER Wiki*. Retrieved April 2, 2008, from [http://oerwiki.iiep-unesco.org/index.php?title=OER\\_development\\_and\\_publishing\\_initiatives](http://oerwiki.iiep-unesco.org/index.php?title=OER_development_and_publishing_initiatives).

Image courtesy of “bfelice” on Flickr



# Open Textbooks

Textbooks are also a growing part of OER. The following is a list of sites that have repositories of open textbooks:

## SEARCH ENGINES

### *E-books on the web*

Searches Internet Archive, Google Book Search and many others. Visitors should note the search engine displays each result in a new window, which may be overwhelming at first.

<http://libweb.lib.buffalo.edu/ft/EBooks.html>

## PUBLIC DOMAIN

### *Making of America*

American education, psychology, history, sociology, religion, and science and technology books. Specializes in 1800-1900 publications. Over 10,000 books and 50,000 articles. <http://quod.lib.umich.edu/m/moagrp/>

### *Manybooks.net*

Provides free eBooks for PDAs, iPods, or eBook readers. Books are available in several languages. <http://manybooks.net/>

## CC-BY-SA OR CC-BY-ND

### *Intratext*

Religious, philosophical, literary, and scientific texts in 40 languages. Over 1,000 texts in English. Licensed CC-BY-NC-SA.  
<http://www.intratext.com/>

### *WikiEducator*

List of free textbooks wiki format. Licensed CC-BY-SA.  
[http://www.wikieducator.org/Free\\_Textbooks](http://www.wikieducator.org/Free_Textbooks)

### *Textbook Revolution*

Textbooks and select educational resources of all kinds. Some of the books are PDF files, others are viewable only online as e-books. Most books are aimed at undergraduates, but there are at least a few resources at every level, from kindergarten to post-doc. All of the books are offered for free by their respective copyright holders for online viewing. They have around 500 books at by the end of 2006 and they expect to have 1,000. All original text on this website is licensed for use under a Creative Commons Attribution-Noncommercial license. The categories of the textbooks are: Biology, Business & Management, Chemistry, Computers-Tech, Earth Sciences, Economics, Engineering, Health Sciences & Medical, History, Math and Physics. CC-BY-NC.  
<http://textbookrevolution.org/>

## GFDL

### *Free High School Science Texts*

Project to build science textbooks for grades 10-12 in South Africa. Topics include Physics, Chemistry and Mathematics. Currently 8 books in development. <http://www.fhsst.org/>

### *Wikibooks*

Sponsored by the Wikimedia foundation (which also supports Wikipedia), Wikibooks is meant specifically for open textbooks. Subjects range from computer programming to cookbooks. All wikibooks are licensed with the GFDL license[1]. More than 28,000 pages across dozens of books. GFDL license. <http://www.wikibooks.org/>

### VARIOUS

#### *The Assayer*

Website that provides links to free textbooks. Registered users can write reviews. The Assayer started in 2000, and has a long history of free textbooks. However, some links are broken or outdated. Over 1,000 books. Open Publication License. <http://www.theassayer.org/>

#### *Open Text Book*

Textbooks on various topics. Most are openly licensed, but license does vary. Over 15 books. <http://www.opentextbook.org>

### NOTES

1. See the *License* chapter for more information.

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# Individual Project Sites

There are individual, isolated OER available on websites scattered throughout the internet. While a Creative Commons Search (see above) can find some of these materials, it will not find all of them. For OER that can't be found through the Creative Commons search engine, use a traditional search engine (Google, Yahoo, etc.) with the keyword “free” or “open” along with the type of resource you're looking for. See the *Search Engine* section for more information.

If you use OER from an individual site, consider writing an e-mail to encourage the content creator. You may also want to point them to appropriate repositories they could submit the OER to as well, so their OER gains more exposure.

## EXAMPLES OF INDIVIDUAL OER SITES (*Various, 2008*):

### *Light and Matter physics and astronomy resources*

Textbooks/OpenCourseWare

Created by Benjamin Crowell, physics and astronomy professor at Fullerton College in southern California, the site offers a series of introductory physics textbooks, free to download, some astronomy learning objects, and some course materials for Dr Crowell's astronomy and physics own courses. Some resources have partial French translations. 8 physics textbooks, 3 astronomy learning objects and materials from 5 physics and astronomy courses. CC-BY-SA  
<http://www.lightandmatter.com/index.html>

### *Managing the Digital Enterprise*

Library of links/OpenCourseWare

An educational site created by Michael Rappa, Professor of Technology Management and Director of the Open Courseware Laboratory in the College of Management at North Carolina State University. The site surveys the many opportunities and challenges managers face in an increasingly digital world, and is open to students and instructors alike. The site is divided into fifteen discussion topics, or "modules." Each module has the same basic structure: a description of the topic that highlights the issues at hand, plus several subsections with links to a variety of educational resources. The modules are updated continuously throughout the year, with new resources added. Over 120 web pages and over 1,200 external links to openly available resources on the Internet. One course on technology management. Full copyright; permission to use. <http://digitalenterprise.org>

### *The OpenFiction Project*

OpenCourseWare

An OpenCourseWare resource for teaching and learning the art of



fiction writing. The OpenFiction Project was created by Stephen Carson and contains the materials that he developed for a distance learning introductory fiction class, originally offered through Emerson College's continuing education programme. (Stephen Carson works for the MIT OpenCourseWare initiative.) Course materials are available on the site or for download (as a zip file of the live contents or as a PDF). There is also an online forum to support users. One course. CC-BY-NC-ND  
<http://www.tofp.org/index.htm>

*PEOI (Professional Education Organization International)*  
OpenCourseWare

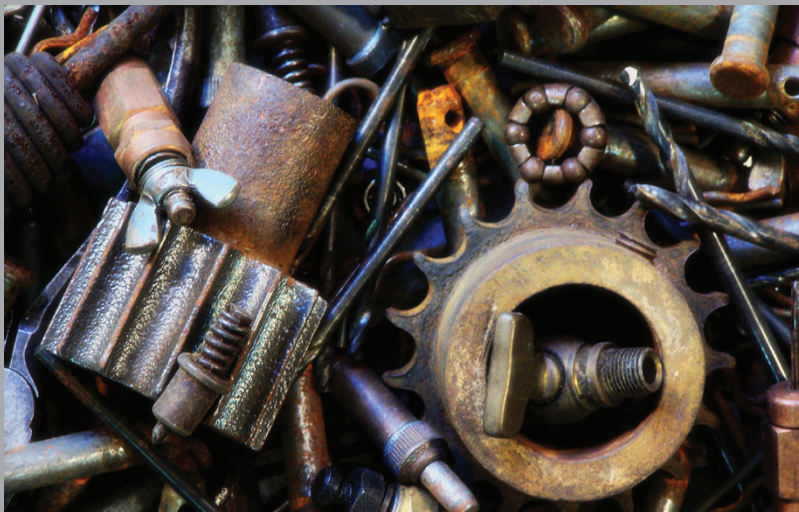
Created by John Petroff, a retired economics professor, PEOI is a volunteer-based project that aims to provide online course content for professional university-level education to improve the skills of aspiring professionals. Anyone can use PEOI course content free of charge. PEOI also offers a range of services such as testing, grading, grade maintenance and attestation of course completion, for a fee to cover costs. Content is available in a range of languages, including English, French, Spanish, Russian, German and Arabic. Seven completed courses (not all available in all languages). CC-BY-NC-SA <http://www.peoi.org>

## SOURCES

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Image courtesy of “Flattop341” on Flickr



# File Formats

File format matters during OER production, and spans all phases of the OER life cycle. Whatever the resource, if it is not in a suitable format, educators and learners might not be able to use it, let alone adapt and remix it to be more effective. This section will outline some of the concepts behind OER and file formats. To check the openness of a particular file format, see *File Formats* in the *Appendices*.

In general, use formats that are open and approved by appropriate standards organizations[1] for interoperability and to ensure access and editability with FLOSS (Free, Libre and Open Source Software).

Popularity of a format also influences how easy it is to adapt and remix. For example, WMV, though not an open format, is very common and there are many tools to convert WMV files to MPEG-4 or MOV, though it should be noted that these conversion tools are rarely free.

When the file formats are kept open, it prevents the OER from inadvertently being “locked” up.

## SCENARIOS

A teacher wants to make a collage. She imports several PNG photos into Photoshop and creates the collage. She saves the file as a PSD and exports a copy as a PNG to post on the web. While others can edit the PNG, it would be a lot easier to edit the PSD file. However, in order to use PSD files, the person has to have a copy of Photoshop.

In this instance, the teacher had a couple of options. She could:

1. Use an open-source alternative to Photoshop (such as in the *Images programs* section in the *Compose* chapter); or
2. Use a more open format when making edits, such as TIFF. The scenario above isn't too harmful, because at least the PNG file is available for use, but ideally the OER would also be available in a format that is more conducive to editing.

Sometimes getting locked into a particular format or program is unavoidable.

## SCENARIO TWO

A teacher wants to create an animation. He uses Adobe Flash to produce it. Although the animation worked perfectly for the lesson, he now realizes that needs to use Flash every time he wants to make a change and that others who want to make changes to the animation need Flash as well.

In the example above, the teacher uses Flash, a popular animation program. While Flash is very powerful, editing Flash files can be difficult/impossible without Adobe's program. Unfortunately, open alternatives to Flash are still in a primitive state and not nearly as widespread. Therefore, it may have been difficult to keep the OER in an open format and compatible with open programs. In situations such as these, the best thing to do is to make an editable version of the file available. For example, the teacher may make the FLA (which is the editable Flash file) available along with the SWF (the file that is typically put in web pages) with a Creative Commons license. While anybody

who wants to localize or remix it will still need to use Flash, they will at least have the ability to do so.

## OPEN ENOUGH?

There is some disagreement about the necessity of an open formats in OER. Some believe that by definition OER cannot use a closed format because technically nobody beyond the file format copyright owner is allowed to alter the format. Others take a more pragmatic view and acknowledge the benefits of open formats but stress that OER creators need to do what works for them (Joyce, 2007; Various, 2008).

As you develop your OER and use OER produced by others, you will begin to have a sense of how much you value open formats. In some ways, the case for open formats is difficult, because it isn't until you've personally had a problem with a closed format that the problems arise. This handbook advocates a "middle-of-the-road perspective" with regards to the necessity of open formats. As you gain more experience developing OER, you will develop your own opinion about open formats.

## OTHER CONSIDERATIONS BESIDES OPEN?

One factor in project planning to consider is the availability of an open format. Some open formats are not very widely known, and some might be hesitant to use them, even though there is nothing wrong with them. Additionally, while open source software is free to download, not everyone may want to use a particular open source program. One example might be the GIMP (see the Images program section). GIMP is an image-editing tool that can do many of the things Photoshop can. However, the GIMP user interface is different from Photoshop, which means it may take a little time to learn. The GIMP user interface also looks less polished than Photoshop, which tends to give users the impression that program is of poor quality.

Another factor to consider is that open source software tend to be "works in progress" and can have bugs. Try using the program a few

times to make sure it is stable. If possible, you should also determine whether or not the open source software has all the capabilities necessary for your project. If you are working on a project with other educators, make sure you've talked about which programs and formats you will use before starting.

## FILE FORMATS AND QUALITY

It is impossible to come up with definitive statements about which formats are optimal for OER development because there are so many possible goals and differing local circumstances. If you are in doubt about which formats to use, check an OER repository that has resources similar to the one you are creating and see which format they use. Below is some guidance on optimizing quality in some media files.

## FORMAT QUALITY

Which formats are better than their rivals is a subject of multiple discussions on the internet (e.g., Ozer 2006; Tsabury, 2007; Microsoft, n.d.). For example, there have been several people who have done tests on audio formats (for example ExtremeTech, 2004; Coalson, n.d.). Along with the sheer number of formats, some formats are being replaced, improved or changed, making the task of choosing one even harder. The task of a format to use can seem daunting, especially when determining something as subjective as “quality.”

However, despite all the discussion about quality in formats, the difference is negligible with regards to OER. That is not to say that there is not a difference between WMV and MPEG-4, or OGG and MP3 audio. Some of these formats do indeed have sharper images and clearer audio. But the most important purpose of OER is pedagogic - to educate and inform. Aesthetic quality, to a certain extent, takes a secondary role. By keeping this perspective and focusing on openness and popularity of the format, the task of selecting a format should be easier.

Media production programs (e.g. Photoshop, Final Cut Pro, etc.) can seem remarkable in their ability to do virtually anything. Still, it saves

a great deal in time and mental anguish to think about quality from the very beginning. As an example, it is much easier to use a quality camera with a good flash when taking pictures, than it is to use Photoshop to adjust lighting and bring out detail. This same principle works with audio as well. It is much easier to use audio equipment that captures clean, crisp sound than it is to use audio filters in an editing program to clear up fuzzy, quiet audio. As the old saying goes, “An ounce of prevention is worth a pound of cure.”

## FORMAT SETTINGS

Many multimedia formats have multiple settings to control quality. These settings can be a better indicator of quality than the choice of format. Programs vary widely in which settings are available for adjustment and how they are changed. When remixing you will want to use high quality files, even though the final file might be at a lesser quality. This is most important when dealing with “lossy” file formats, such as JPEG and MP3. With both of these formats, each time you save, a little bit of quality is lost, similar to making a photocopy of a photocopy. Therefore, when doing the actual localizing and remixing before publishing, it is important to use a lossless format or at least high-quality settings with lossy formats. For example, when using Photoshop to create an OER you would want to use a TIFF or PSD to save the files, but the final image might be in JPEG or PNG format. Ideally, be able to make the original high-quality files, along with the final files, available in case others wish to localize or remix your work.

Image or video size is also a factor in localizing and remixing. Images or video can be shrunk in size using a variety of programs. However, enlarging images or video results in a loss of quality, though small increases in size should not be too detrimental. When working with video or images it is recommended that you work at a size or two larger than the size at which you intend the final OER to be rendered.

The following is a list of settings that are well-suited to remixing:

## IMAGES

- ▶ At least 640px x 420px
- ▶ Lossless file type (TIFF, RAW, PNG)

Make sure you keep multiple backups of files if you plan on using many filters or making adjustments.

## VIDEOS

At least 640px x 420px

- ▶ DV, HDV formats
- ▶ Avoid re-compressing the footage as much as possible.

## AUDIO

- ▶ At least 128kps VBR (Variable Bit Rate)
- ▶ WAV, AIFF
- ▶ Avoid excessive audio filters that unnecessarily distort audio.

## STANDARDS AND INTEROPERABILITY

Technical standards affect the ability to exchange and share information and content between systems (e.g. between repositories and LMS). For small projects, such as single file OER, using the appropriate technical standards isn't extremely difficult. But packaging whole courses to be compatible with major LMS means paying particular attention to these standards. You are not expected to know how to convert your course to these standards, but you should be aware of what these standards mean and when they are used.

Content packaging and exchange format standards are relevant for

OER projects publishing whole courses, who want to enable users to download the courses into their local learning management systems or exchange OpenCourseWare between projects. IMS Content Packaging (IMS CP) is the standard for course materials that was informally agreed to by the OpenCourseWare Consortium. Unfortunately, different software applications implement the IMS CP standard in slightly different ways – this means software must be specifically programmed for packages coming from different providers. Some example providers include: the proprietary WebCT / Blackboard learning management system, the MIT OpenCourseWare repository, and the eduCommons OpenCourseWare platform. In addition, there are conversations about the benefits of the new IMS Common Cartridge standard (IMS CC), and it is expected that many OpenCourseWare projects will eventually move towards it. SCORM is another content packaging standard, but it finds relatively little support among open source software projects or OpenCourseWare initiatives.

## WHAT DO ALL THESE CONTENT PACKAGES MEAN FOR ME?

Many LMS programs such as Moodle[2], Blackboard and WebCT include the ability to export IMS Content Packages for easier uploading to programs like eduCommons[3]. However, because IMS packages vary so much in implementation, it is rare to have a course upload perfectly. That means you should be prepared to spend time fixing errors that creep in during the import process. If you are creating a course from scratch without the benefit of an LMS, do the best you can in organizing and labeling your course, including the file names and folder organization. You could also use the RELOAD[4], an open source packaging editor, to create standard IMS Content Packages with accompanying metadata.

## NOTES

1. Such as the ISO, World Wide Web Consortium, OASIS, IMS Global Learning Consortium, etc.



2. <http://www.moodle.org/>
3. <http://cosl.usu.edu/projects/educommons/>
4. <http://www.reload.ac.uk>

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Image courtesy of “Clav” on Flickr



# Accessibility

When searching for OER, it is also important to keep accessibility in mind. Wikipedia defines accessibility as follows:

*Accessibility is a general term used to describe the degree to which a product (e.g., device, service, environment) is accessible by as many people as possible. Accessibility can be viewed as the “ability to access” the functionality, and possible benefit, of some system or entity. Accessibility is often used to focus on people with disabilities and their right of access to entities, often through use of assistive technology. Several definitions of accessibility refer directly to access-based individual rights laws and regulations. Products or services designed to meet these regulations are often termed Easy Access or Accessible (“Accessibility,” 2008).*

The W3C's Web Accessibility Initiative(WAI) speaks more specifically about accessibility online:

*Web accessibility means that people with disabilities can use the Web. More specifically, Web accessibility means that people with disabilities can perceive, understand, navigate, and interact with the Web, and that they can contribute to the Web. Web accessibility also benefits others, including older people with changing abilities due to aging (WAI, 2005).*

Some material may be better suited for accommodating persons with disabilities better than others. For example, videos with captions (like those on the website dotSUB[1]) are preferable to those that do not include captions. Some persons with disabilities have low-vision or colorblindness, making low-contrast images difficult for them to interpret fully. Text sizes should also be kept above a 10pt size, and all images and videos should be large enough to be plainly visible. If you are making an OER that is strictly audio, an accompanying transcript should be provided for the hearing-impaired.

File types also play a role in accessibility. For example, it is easier to add captions to a MOV file than a WMV or SWF file, although there are programs that allow conversion between the different file formats. Because there are so many different combinations of file formats and accessibility situations, it is impossible to give definitive guidelines regarding each format. If you have reason to believe that a file format might have accessibility issues, use a search engine to find more information. You can also perform a preliminary test with a person who has the disability to determine how well the resource works.

Subsequent sections of this handbook will show you how to create an OER with accessibility features. For general information about making online resources (including OERs) accessible, see the WAI's Implementation Plan for Web Accessibility[2] and the Web Content Accessibility Guidelines (WCAG) Overview[3].

## NOTES

1. <http://www.dotsub.com/>

2. <http://www.w3.org/WAI/impl/Overview>
3. <http://www.w3.org/WAI/intro/wcag.php>

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# Perspectives

I have used Flickr quite often for searching for CC licensed photos same with Google and license search. Every database with a quality assurance system is quite helpful, i.e. Merlot - most of them lack a critical mass of reviews (better) or votes (so please write a feedback if you use it!) (Braun, 2008).

It is recommended that prioritization areas for selecting courseware is weighted towards:

- ▶ Areas of broadest utility - i.e. widely taught by a majority of providers, and applicable to large number of learners.
- ▶ Areas that will help deliver significant productivity gains or ‘transitional’ benefits towards a knowledge economy.
- ▶ Areas that do not duplicate good quality alternatives readily available elsewhere
- ▶ Areas of demand – i.e. users are ready to accept mode of delivery. (Wyles, 2008)

All resources in the world are potential educational resources - we should use them and not to think that there is some mysterious “edu-add-value” one is adding in them. Most of the time the “mysterious” thing is simply “dogmatism” - someone want to tell you how things are, or an attempt to simplify complex issues - it’s enough to understand the things in this level. This is not to say that there isn’t need for good text and study books. There is, and they should be free cultural works (Leinonen, 2007).

The potential for non-profits and for-profits to use this technology to engage constituents and customers is immense. Keep in mind though, that the project is still young, but with something as game-changing as this, I am sure a rapid community will grow around the project to make it a big success in the months and years to come (Ko, 2008).

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Wyles, R. (Last updated 2008, March 27). OER stories: New Zealand OER Project. Retrieved May 14, 2008, from [http://oerwiki.iiep-unesco.org/index.php?title=OER\\_stories:\\_New\\_Zealand\\_OER\\_Project](http://oerwiki.iiep-unesco.org/index.php?title=OER_stories:_New_Zealand_OER_Project)

*Space for Personal Notes*



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Image courtesy of "kentbye" on Flickr





# Compose

opportunities to create and share

In this chapter

QUALITY

AUDIO

IMAGES

LEARNING SUPPORT SYSTEMS

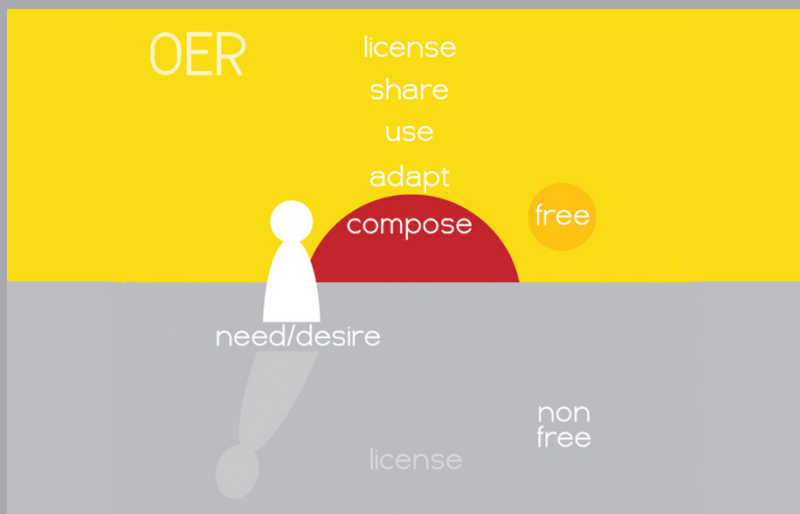
OFFICE

WEB AUTHORING

VIDEO

MOBILE ACCESS

PERSPECTIVES



## Compose

If you don't find ready-made resources that are easily adapted for use in your situation, then you may need to build some from scratch.

The easiest way to get started is to join in on an existing project like Wikipedia or Wikiversity. Even making small edits or corrections adds (cumulative) value.

These projects tend to attract subject experts and some of the resources may lack the pedagogical finesse of educators. Over time, as you gain confidence in your OER development skills, you can move on to contributing larger sections or even starting your own project.

This chapter covers a range of tools commonly used in OER production and includes a section on issues to consider if you intend your OER to be accessible via mobile devices. New tools are constantly being developed, and some suggest others not listed in this handbook (<http://ngoinbox.org/>).

The software tools recommended in this handbook are open source[1].

Some are more complex than others and may take time to learn. Others involve complex installation procedures. The quality and availability of help files and documentation vary significantly in the open source world. Those included in this handbook are generally well supported, and you can almost always find a vibrant community of willing users and developers to assist when needed.

During the course of an OER project, you may encounter the need for a feature not supported by the program you are using. In this case, find a program that does, export your work in a suitable data format, and continue.

The important thing is to have a clear idea of what you intend to do, and find the right tools with the right combination of features to help you achieve your objectives.

Share your OER as soon as possible to attract others who might help with your project[2].

## NOTES

1. See *Licensing* and *Adapt* chapters for more information.
2. See the *Share chapter* for more information.

# Quality

In all phases of the OER cycle, attention to quality is vital. Issues around the quality of OER are debated vociferously within the OER community. This handbook does not cover fully the issue of quality, but highlights a few things for you to keep in mind while composing, remixing and adapting OER.

During composition, think of the learners and the learning environment. Are the resources suitable and being pieced together in a way that will engage the learners and enable them to reach the required level of understanding?

## REFLECTION

- ▶ Is there any objectionable material, or material is that is counter to institutional policy?
- ▶ Is the material appropriate for that grade?
- ▶ Is the material culturally relevant and appropriate?
- ▶ Is the OER aligned and supportive of applicable curriculum mandates?
- ▶ Is there a close relationship between the OER and the other resources with which the learners will engage?
  - » If so, is there anything that can be done to enhance this synergy?
- ▶ What is valuable about this OER?
  - » What does this OER have that my current teaching materials do not have?
- ▶ Are there any factual errors in the OER?
- ▶ Are there parts of the OER that are less interesting than others?

Based on your answers, select components to include and prioritize areas for revision and localisation. For example, objectionable material should be excluded immediately, factual errors should be eliminated, and consider whether or not it makes sense to localize components before remixing. Decisions on which components to include will be constrained by the resources you have available including time, people with technical and artistic skills, etc. In particular, think about the extent of revision and localization required. Ultimately, you need to decide which changes are most helpful and practical under the circumstances. Quality is contextual, and no one knows the context of your own classroom and learners better than you (and the learners).”

## THE ULTIMATE TEST

*Do learners actually learn the intended knowledge, skills, or attitudes from the OER?*

It is not uncommon for the composer to feel a strong sense of ownership and pride having built an OER, and to proceed to use it with great enthusiasm. This has been known on occasion to blind the educator to its ineffectiveness. Therefore, be sensitive to the efficacy of the OER. Observe your learners and get their feedback. Continually adapt the resources and be prepared to dispense with an OER if it is not working for your learners[1].

## COLLABORATE FOR QUALITY

Whether you are composing OER for learners, for fellow educators, or for personal growth, developing OER is a learning experience in itself. Being part of a community of educators can greatly enhance your work. Engage with the community in all phases of the OER development cycle, even the early phases of composition. There will certainly be peers with common interests facing the same sorts of challenges. The result will be an a higher quality OER for yourself, your learners and the OER community as a whole. See OER Forums in the Conclusion for potential places to meet peers[2].

## NOTES

1. Some repositories have discussion forums or social networking features. Check the more popular and widely used OER Repositories to see what kinds of collaboration are available.
2. See *Evaluation* in the *Use* chapter for more information.



# Audio

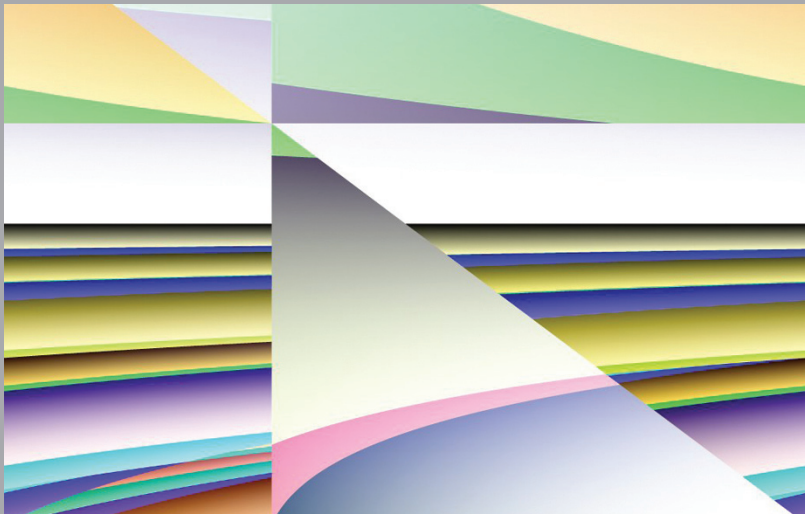
Audacity is the most widely used open-source audio editing tool. MPlayer can play a wide range of formats. Songbird has some nice features that set it apart from other music players.

PROGRAM NAME	USES OF PROGRAM	COMPATIBLE FORMATS	OPERATING SYSTEMS
Audacity [1]	Audio recorder/editor. <i>For help see WikiEducator’s Audacity Tutorials</i> [2]	WAV, AIFF, OGG, FLAC	Windows®, Mac OS X®, GNU/Linux
Juice [3]	Subscribe and manage podcasts	MP3, OGG, and similar audio files	Windows®, Mac OS X®, GNU/Linux
MPlayer [4]	Audio and video player with multiple skins for different appearance	Numerous audio/video formats, with several open formats	Windows®, Mac OS X®, GNU/Linux
Songbird [5]	Audio and video player with built-in web browser; easy download of audio files from a website	MP3, MPEG-4, OGG, ACC, WMA	Windows®, Mac OS X®, GNU/Linux

## NOTES

1. <http://audacity.sourceforge.net/>
2. [http://www.wikieducator.org/Using\\_Audacity](http://www.wikieducator.org/Using_Audacity)
3. <http://juicereceiver.sourceforge.net/download/index.php>
4. <http://www.mplayerhq.hu/design7/dload.html>
5. <http://www.songbirdnest.com/>

Image courtesy of “vbsouthern” on Flickr



# Images

*Besides Open Office, GIMP is one of the most well known open source programs currently available. Paint.Net is very easy to use, but is only available for Windows. Tux Paint is a great program for younger students.*

PROGRAM NAME	USES OF PROGRAM	COMPATIBLE FORMATS	OPERATING SYSTEMS
Cinepaint[1]	Image editing. <i>Documentation</i> [2]	Common image formats	GNU/GNU/ Linux, Windows® (in development)
GIMP(GNU Image Manipulation Program)[3]	Image editing, similar to Photoshop. <i>Tutorials</i> [4]	JPEG, PNG, GIF, XCF	Windows®, Mac OS X® (difficult to install), GNU/GNU/Linux
Inkscape[5]	Drawing tool, similar to Illustrator. <i>Basic tutorial</i> [6]	SVG, PNG	Windows®, Mac OS X®, GNU/GNU/Linux



Krita[7]	Image editor designed for GNU/GNU/Linux's K Desktop <i>Environment. Handbook</i> [8]	TIFF, PNG, JPEG, XCF, RAW	GNU/GNU/Linux
Paint.NET[9]	Image editing, similar to Photoshop. <i>Tutorials</i> [10]	JPEG, GIF, PNG	Windows®
Tux Paint[11]	Image editing, especially designed for children. <i>Screencasts</i> [12]	Unknown	Windows®, Mac OS X®, GNU/GNU/Linux

## ONLINE IMAGE EDITORS

As with online office suites, you do not have complete control over online image editors. Depending on student privacy policies at your institution, you may be not be able to use these photo editors.

PROGRAM NAME	USES OF PROGRAM	COMPATIBLE FORMATS	COMPATIBLE WEB BROWSERS
Picnik[13]	Basic photo editing that is compatibility with Flickr, Facebook, Myspace and Picasa	Common image formats	Internet Explorer, Firefox, possibly others

Photoshop Express[14]	Basic photo editing based on the popular Photoshop program, though not nearly as powerful. Ability to publicly display photos	Common Image formats	All browsers compatible with Flash 9 plugin (Internet Explorer, Firefox, etc.)
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## NOTES

1. <http://www.cinepaint.org/>
2. <http://www.cinepaint.org/docs/index.html>
3. <http://www.gIMP.org/>
4. <http://www.gIMP.org/tutorials/>
5. <http://www.inkscape.org/>
6. <http://www.inkscape.org/doc/basic/tutorial-basic.html>
7. <http://www.koffice.org/krita/>
8. <http://docs.kde.org/development/en/koffice/krita/>
9. <http://www.getpaint.net/>
10. <http://en.wikibooks.org/wiki/Paint.NET/Contents/Tutorials>
11. <http://www.tuxpaint.org/>
12. <http://www.tuxpaint.org/videos/>
13. <http://www.picnik.com/>
14. <https://www.photoshop.com/express/landing.html>

Image courtesy of “leighblackall” on Flickr



# Learning Support Systems

*Since the advent of the Internet and associated opportunities for on-line learning and, more recently, “connected” or “networked” learning through social software, the range of systems and supporting tools available is growing rapidly. In this section we highlight a few prominent examples of learning management systems (LMSs), virtual learning environments (VLEs), content management systems (CMSs), blogging and wiki engines, and other tools offering combinations of resources for OER development.*

## LMS's AND VLE's

A learning management system (LMS) is software designed to manage classes, including attendee lists, quizzes, calendars, assignments and learning modules. Virtual Learning Environments are similar in concept emphasizing the learning environment over management. For the purposes of this document, a clear distinction is not made.

The most widely-known proprietary example is Blackboard/WebCT. Elgg is meant for institutional deployment, but not necessarily for individual classrooms. Moodle, by contrast, can be used in an individual classroom, or by an entire school. Many educators have used Moodle in their classroom, so there is a wealth of information available on how to use it. Sakai is used by higher education institutions and research groups and is not well-suited for individual classrooms.

PROGRAM NAME	USES OF PROGRAM	COMPATIBLE FORMATS	OPERATING SYSTEMS
ATutor [1]	LMS with group blogs, quizzes, and assignment drop boxes.	HTML, common audio/image/video formats; IMS and SCORM support	GNU/GNU/Linux usually
Claroline [2]	LMS with group chat, quizzes, wiki and online chat	HTML, common audio/image/video formats	GNU/GNU/Linux usually, but also available for Windows®; and Mac OS X®
Elgg [3]	Social networking software that allows students to have their own webpage	HTML, common audio/image/video formats	GNU/GNU/Linux usually
KEWL. NextGen [4]	LMS with e-mail, instant messaging and course modules.	HTML, common audio/image/video formats	GNU/GNU/Linux usually

*chart continues on next page*

Moodle [5]	Learning management system, similar to Blackboard/ WebCT. <i>Tutorials</i> [6]	HTML, common audio/image/ video formats, eventual IMS support	GNU/GNU/ Linux usually, compatible with others
Rhaptos [7]	“Software to enable authors, instructors, and students to create, select, and assemble modular educational content into collections customized to meet their teaching and learning needs” <i>Documentation</i> [8]	HTML, common audio/ image/video formats, IMS support	GNU/GNU/ Linux usually
Sakai [9]	Enterprise-wide learning Management system, similar to Blackboard/ WebCT. <i>Tutorials</i> [10]	HTML, RSS, common audio/ image/video formats, IMS support	GNU/GNU/ Linux usually, compatible with others

## CONTENT MANAGEMENT SYSTEMS

Drupal, Joomla! and Plone are some of the most popular open source content management systems (CMS) available. CMSs, by default, do not have quiz and grading features. These features can be added, or the CMS can simply be used to store class documents, images and video. CMSs can be difficult to deploy without the help of IT staff.

PROGRAM NAME	USES OF PROGRAM	COMPATIBLE FORMATS	OPERATING SYSTEMS
Drupal [11]	Content management system written in PHP. <i>Handbooks</i> [12]	HTML, common audio/image/video formats	GNU/GNU/Linux usually
EduCommons [16]	eduCommons is an Open-CourseWare management system designed specifically for OpenCourseWare. <i>Documentation</i> [17]	HTML, commons audio/image/video formats, IMS packages	GNU/GNU/Linux usually, Windows® installer in development
Joomla! [15]	Content management system written in PHP. <i>Getting Started Guide</i> [16]	HTML, common audio/image/video formats	GNU/GNU/Linux
Plone [17]	Content management system written in Python. <i>Documentation</i> [18]	HTML, common audio/image/video formats	GNU/GNU/Linux usually

# WIKIS

Wikis started out as a very simple way of creating easily editable web pages. The concept caught on in a big way with Wikipedia. The education community has attempted to inspire this degree of cooperation by establishing sites such as WikiEducator, Wikiversity, Appropedia, etc. One of the most popular wiki engines is MediaWiki after its notable success with Wikipedia.

PROGRAM NAME	USES OF PROGRAM	COMPATIBLE FORMATS	OPERATING SYSTEMS
Dokuwiki [19]	Designed especially for creating documentation. <i>User Forum</i> . [20]	HTML, common audio/image/video formats	GNU/GNU/Linux usually
MediaWiki [21]	Written in PHP, used by Wikipedia, WikiEducator and Wikiversity and others. <i>Documentation</i> [22]	HTML, common audio/image/video formats	GNU/GNU/Linux usually
Twiki [23]	Written in the Perl programming language, used by Motorola and other businesses. <i>Documentation</i> [24]	HTML, common audio/image/video formats	GNU/GNU/Linux usually



## BLOGS

A “blog” (short for “web log”) makes it easy to publish individual entries or stories and time stamps the entries to form a log of activities, postings, etc. The power of blogs has been used in education successfully in a variety of ways to communicate course activities, report on progress and to generate discussion among learners. A good example which may interest readers of this manual is “Terra Incognita: exploring new ground in online education”[25]. See *Additional Reading* in the *Conclusion*.

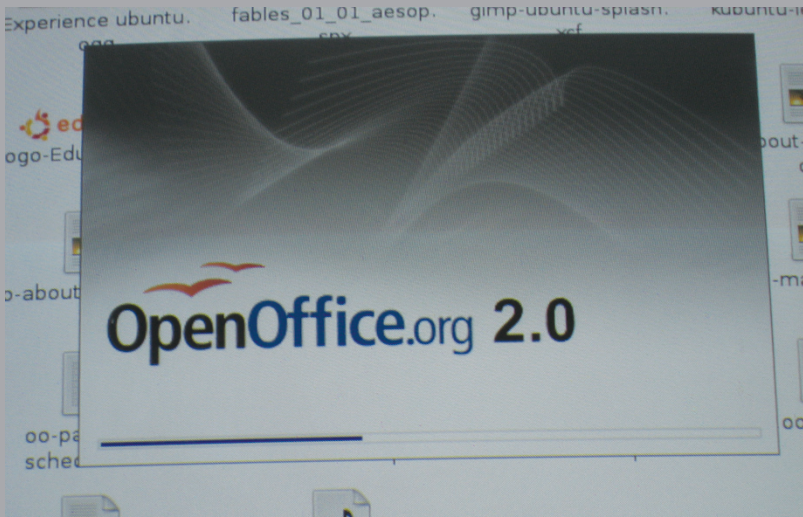
PROGRAM NAME	USES OF PROGRAM	COMPATIBLE FORMATS	OPERATING SYSTEMS
Movable Type  http://www.movabletype.org/	Common blogging software, written in Perl. Not as popular as Wordpress, but still well-regarded. Documentation [26]	HTML, common audio/image/video formats	GNU/GNU/Linux, Mac OS X®, Windows®
Wordpress [27]	Popular blogging software written in PHP. <i>Tutorials</i> [28]	HTML, common audio/image/video formats	GNU/GNU/Linux usually

*It should be noted that most prominent CMSs, LMSs and VLEs either include or may be extended to include wikis and blogs.*

## NOTES

1. <http://www.atutor.ca/>
2. <http://www.claroline.net/>
3. <http://elgg.org/>
4. <http://kngforge.uwc.ac.za/index.php?module=splashscreen#>
5. <http://moodle.org/>
6. [http://docs.moodle.org/en/Teaching\\_with\\_Moodle](http://docs.moodle.org/en/Teaching_with_Moodle)
7. <http://rhaptos.org/>
8. from the Rhaptos home page
9. <http://sakaiproject.org/>
10. <http://smartsite.ucdavis.edu:8000/smartsite/ucd-gateway/Smartsite%20Tech%20Tips/index.htm>
11. <http://drupal.org/>
12. <http://drupal.org/handbooks>
13. <http://cosl.usu.edu/projects/educommons>
14. <http://cosl.usu.edu/projects/educommons/documentation>
15. <http://www.joomla.org/>
16. <http://docs.joomla.org/Beginners>
17. <http://plone.org/>
18. <http://plone.org/documentation>
19. <http://wiki.splitbrain.org/wiki:dokuwiki>
20. <http://forum.dokuwiki.org/>
21. <http://www.mediawiki.org/wiki/MediaWiki>
22. <http://www.mediawiki.org/wiki/Documentation>
23. <http://twiki.org/>
24. <http://twiki.org/cgi-bin/view/TWiki/TWikiDocumentation>
25. <http://blog.worldcampus.psu.edu/>
26. <http://www.movabletype.org/documentation/>
27. <http://wordpress.org/download/>
28. [http://codex.wordpress.org/Getting\\_Started\\_with\\_WordPress](http://codex.wordpress.org/Getting_Started_with_WordPress)

*Image courtesy of “swruler9284” on Flickr*



# Office

Open source office programs are a great example of open source programs competing well with their proprietary counterparts. Be careful when selecting a format to save in, especially when you plan on switching between a proprietary office program and an open source one. For example, Open Office saves word processing files as ODT, which cannot be opened in Microsoft Word without a special plug-in.

PROGRAM NAME	USES OF PROGRAM	COMPATIBLE FORMATS	OPERATING SYSTEMS
Abiword[1]	Word processor uses little memory. Similar to Word. <i>User Manual</i> [2]	Rich Text Format, Plain Text, HTML	Windows®, Mac OS X®, GNU/Linux
Open Office[3]	Popular: word processor, spreadsheet, math equation editor, drawing program and database application. <i>Tutorials</i> [4]	Depends on the program, but includes many of the popular formats	Windows®, Mac OS X® (called Neo Office), GNU/Linux
Scribus[5]	Desktop pub. for designing brochures and newsletters (similar to Adobe's InDesign). <i>Scribus Tutorial</i> [6]	Unknown	Windows®, Mac OS X®, GNU/Linux

ONLINE OFFICE SUITES

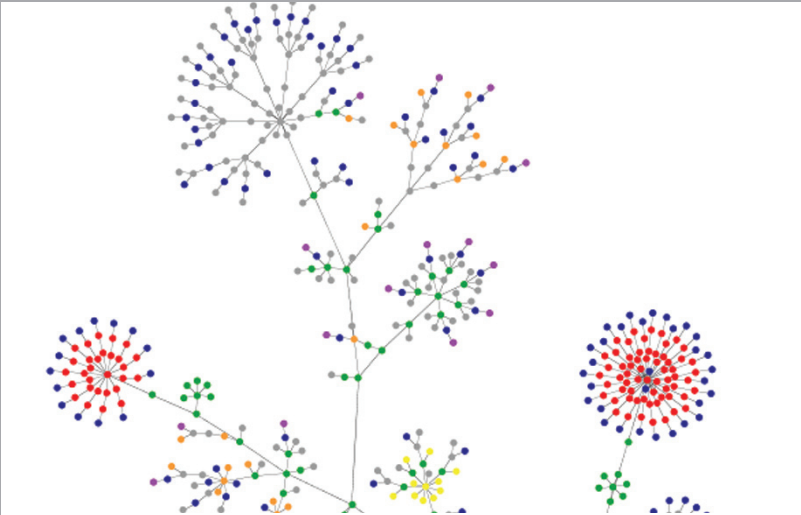
Online office suites are not open source, but many are free to use. When using an online office suite you do not have complete control over your information. Though many of these services have privacy policies which stipulate that they will not use your information, they may be incompatible with privacy laws regarding students’ information. Online office suites are compatible with all operating systems, but not all web browsers.

PROGRAM NAME	USES OF PROGRAM	COMPATIBLE FORMATS	SUPPORTED WEB BROWSERS
Google Docs [7]	Word processing, spreadsheet and presentation programs. Users can share with other Google account members. Ability to publish directly to blogs.	Depends on the program, but includes many of the popular formats	Internet Explorer, Firefox, Safari (somewhat buggy)
Thinkfree Office Suite [8]	Word processing, spreadsheet, and presentation programs as well as HTML editor; share documents with other users	Depends on the program, but includes many of the popular formats	Internet Explorer, Firefox, possibly others

Zoho [9]	Online suite of office programs including word processor, spreadsheet and PowerPoint-like presentation software. Ability to use without an internet connection has been recently added.	Depends on the program, but includes many of the popular formats	Internet Explorer, Firefox, Safari (planned)
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## NOTES

1. ↑ <http://www.abisource.com/>
2. ↑ <http://www.abisource.com/support/manual/>
3. ↑ <http://www.openoffice.org/>
4. ↑ <http://www.learnopenoffice.org/index.htm>
5. ↑ <http://www.scribus.net/>
6. ↑ <http://www.scribd.com/doc/936858/Scribus-Manual>
7. ↑ <http://docs.google.com>
8. ↑ <http://member.thinkfree.com/>
9. ↑ <http://www.zoho.com/>



# Web Authoring

eXe is a basic HTML editor with special features supporting educational content creation that is designed for people who are unfamiliar with HTML. Bluefish is geared towards educators who already know HTML. Filezilla is easy to use and helpful for moving files between computers and servers.

PROGRAM NAME	USES OF PROGRAM	COMPATIBLE FORMATS	OPERATING SYSTEMS
Bluefish[1]	HTML editor. <i>Guide</i> [2]	HTML, CSS	Windows® , Mac OS X®, GNU/Linux
eXe[3]	HTML editor with modules (quizzes) for easy site creation <i>Online manual</i> [4]	HTML, CSS	Windows®, Mac OS X®, GNU/Linux

Filezilla[5]	FTP (File Transfer Protocol); used for moving pages and images to a website.	Any type of file found on the internet	Windows®, Mac OS X®, GNU/Linux
Firefox[6]	Web browser similar to Internet explorer with extensions to add functionality and change appearance. <i>Tutorial about extensions[7]</i>	Compatible with most web pages	Windows®, Mac OS X®, GNU/Linux
KompoZer[8]	HTML, similar to Adobe Dreamweaver. Formerly called NVU.	Any type of file found on the internet	Windows®, Mac OS X®, GNU/Linux

## NOTES

1. <http://bluefish.openoffice.nl/>
2. <http://www.unc.edu/~whitews/bluefish/book.html>
3. <http://exelearning.org/>
4. [http://www.wikieducator.org/Online\\_manual](http://www.wikieducator.org/Online_manual)
5. <http://filezilla-project.org/> (See Self-publishing in Publish OER for more information.)
6. <http://www.mozilla.com/en-US/firefox/>
7. <http://www.newbie.org/firefox/>
8. <http://www.kompozer.net/about/>



Image courtesy of “Solar ikon” on Flickr



# Video

Because creating video and animation programs can be complex, there are few open source programs for video editing. Blender is an excellent program, but has a steep learning curve; be sure to give yourself plenty of time to learn. Cinelarra, while a good program, is buggy. Also, note that Cinelarra and Kino only run on GNU/Linux.

PROGRAM NAME	USES OF PROGRAM	COMPATIBLE FORMATS	OPERATING SYSTEMS
Blender[1]	Complex 3D animation and pictures, similar to Maya. <i>User manual</i> [2]	Many of the common image and movie formats such as MOV, JPEG, TIFF, etc.	Windows®, Mac OS X®, GNU/Linux

PROGRAM NAME	USES OF PROGRAM	COMPATIBLE FORMATS	OPERATING SYSTEMS
Cinelarra[3]	editing video and audio. <i>Documentation</i> [4]	Unknown	GNU/Linux only
Kino[5]	Basic video editor, similar to iMovie. <i>Documentation</i> [6]	DV, AVI	GNU/Linux only

## NOTES

1. ↑ <http://www.blender.org/>
2. ↑ <http://wiki.blender.org/index.php/Manual>
3. ↑ <http://heroinewarrior.com/cinelerra.php3>
4. ↑ <http://heroinewarrior.com/cinelerra/cinelerra.html>
5. ↑ <http://kinodv.org/>
6. ↑ <http://www.kinodv.org/docbook/>

Image courtesy of “DeclanTM” on Flickr



# Mobile Access

*Mobile devices include small computing devices, such as handheld computers, sub-laptops, mobile media players, and even cell phones. In many areas of world, access to mobile phones is more widespread than access to desktop computers. In addition, access to cell networks is more widely distributed than access to traditional Internet (via landlines, T1, or WiFi). Mobile devices have been found to be effective tools for learning and in many cases are easier to integrate into instruction. For all of these reasons, accessing OER via mobile devices is an important thing to consider.*

*Specific OER projects may or may not be well-suited for use on mobile devices, depending on how they were developed, how they are hosted, and a variety of other considerations.*

## ONLINE VS. OFFLINE USE

While most OER exist online, mobile users often prefer to download content and access it offline. Content can be provided offline in formats such as ebooks, word processing documents, or multimedia files. These files can then be stored on a memory card or on internal device memory. As an example, some universities distribute online courses for access

on mobile devices. This course content can be downloaded on a desktop computer and then transferred to a memory card for offline use on a cell phone or handheld device like an iPod.

In order for OER to work in this way, developers need to make the content available in a downloadable format. Using XML or a similar system that tags content in a flexible way can make exporting content for various types of use feasible. See the discussion of file format issues below for more information.

The most common problem with mobile versions of an OER is device incompatibility. There is no way to test on all possible mobile devices. Therefore, you should focus on testing mobile devices that will be used by your target audience. Ideally all learners would be using the same mobile device, though that is rarely the case in practice.

## BANDWIDTH REQUIREMENTS

When content is going to be streamed or viewed online, bandwidth is an important consideration. Mobile devices with Internet access often have relatively low connection speeds. This low connectivity results in longer download times, especially for multimedia content. One solution to this is to present content in smaller chunks that can be downloaded individually. Bandwidth requirements can also be reduced by shrinking or reducing images, breaking up pages of text, or re-encoding video for smaller file sizes. It is recommended that you try out your lesson using the available bandwidth before distributing it.

## DEVICE ISSUES

Mobile devices come in a wide variety of sizes and with many operating systems and software programs. Keeping in mind the unique features of mobile devices is important if OER content is to be usable.

## DISPLAY SIZE

Display size is one consideration. Most mobile devices have a relatively small screen size (e.g. 320 x 240 pixels). While often a concern, research has shown that readability and comprehension are not affected by small

screen sizes. Anecdotal observation of learners with mobile devices confirms this (Fasimpaur, 2003).

Simple text is generally not adversely affected by screen size, because the text will reflow to fit the screen. However, images, video, and text that is highly formatted can be rendered unusable on small screens. Design suggestions to maximize usability include avoiding tables, frames, and columns; providing low resolution version of images; including text alternatives for images; and avoiding pop-ups and Flash animation. (These suggestions will also increase accessibility for persons with disabilities as well[1].)

Content creators who want their content to be accessible to mobile users may wish to consider providing a mobile version of their site, as done by Wikipedia and others. Again, using XML and content-based tags will make compiling multiple versions like this easier.

## FILE FORMAT

Another issue to consider is file format (see File Format section for a list of formats). Some mobile devices have browsers that can read standard HTML files (see below), but for offline viewing or multimedia files, other file formats should be considered. While many proponents of OER favor “open” file formats, at present, most mobile devices do not support these formats. Ideally, content providers will offer options for different users.

For text-based information, simple text, RTF, or HTML files are widely accessible formats. Formats such as DOC (MS Word), ODT (Open Office), or PDFs should be avoided if possible, since they are not widely available on mobile devices. For many handhelds, ebooks are a favorable format since they provide extra features like hyperlinks, linked dictionaries, and even text to speech capabilities. However, to provide ebooks, a developer must know the software available for the target users’ devices. (There are many different ebook programs.) Mobipocket is one of the most widely used ebook readers, because it supports many devices. Microsoft Reader is another commonly used ebook format, but is not as broadly compatible.[2]

For audio content, MP3 is the obvious choice for file format. While this is not strictly speaking an open format, it is a format that will play on

nearly every device that plays audio. (The open alternative is OGG, which is supported on very few devices.)

For video content, there is currently not one format that works on most mobile devices. The options for content providers are to provide video content in multiple formats or to suggest that users convert to the video to their own format of choice.

## BROWSER CAPABILITY FOR ONLINE CONTENT

For online content, it is important to remember that mobile device browsers vary in their capabilities. Often items like Javascript, Flash, or other types of interactive features will not work properly on mobile devices. Frames and tables also do not display well on small screen browsers.

## TECHNICAL SUPPORT FOR LEARNERS

In order for OER to be successful on mobile devices, learners must be familiar with their device, the device capabilities, and how to access and use content available via the device. This may involve delivering training and technical support to make sure learners can effectively use the tools.

## NOTES

1. See *Use Accessibility* in *Use* chapter for more details.
2. These are both free, but not open, tools.

## SOURCES

Garreau, J. "Our Cells, Ourselves." Retrieved April 16, 2008, from [http://www.washingtonpost.com/wp-dyn/content/article/2008/02/22/AR2008022202283\\_pf.html](http://www.washingtonpost.com/wp-dyn/content/article/2008/02/22/AR2008022202283_pf.html)

Fasimpaur, K. (2003). "101 Great Educational Uses for Your Handheld Computer." Long Beach, CA: K12 Handhelds, Inc.



# Perspectives

A middle school in Delaware was looking for short reading selections that students could access on mobile devices to practice reading comprehension and identifying cause and effect. While the school’s textbooks had some reading passages, they were copyrighted and could not be put on the mobile devices (or the Internet). The school wanted to use mobile devices, because all of their students already had them, and the devices were very motivating to students. They were also looking for more passages and the inclusion of interactivity so that students could practice their skills and get immediate feedback.

Rather than write new passages for this, the school chose to make use of OER. Reading passages were taken from Wikibooks and Wikipedia and adapted for the specific classroom’s needs. Questions were added that emphasized the cause and effect skills being taught. These passages were then merged into one document and reformatted as an ebook. Students could then use these and get immediate feedback as they answered the questions.

This project was easy to manage and successful. The fact that the open resources that were used could be edited was critical, because it allowed



the materials to be edited to be appropriate for the students using them (Fasimpaur, 2008).

Getting high quality artwork to enrich your OER can be a challenge (especially if you're not an artist), but it's an important part of making OER engaging and comprehensible. The OER site FreeReading.net has been successful in getting community members to contribute in a variety of areas, including art. Artist Cheryl Johnson has contributed some wonderful illustrations to the project. (It's interesting to note that Johnson does not consider herself computer savvy. Her artwork is hand drawn and scanned in. This makes the important point that some of the best contributions to OER can come from outside the tech community.)

About contributing to the project, Johnson says, "Recently I was directed to the website Free-Reading.net and was told that it was in need of artists willing to contribute illustrations of short passages as a resource for teaching literacy to young children. I checked online and saw what was required in the way of art and decided to devote some time to the site. This was the very kind of artwork that I have enjoyed drawing most of my life especially as my own four children were growing up. I have always liked doing line drawings to color in and have spent many happy hours with children, mine and their friends, drawing on demand so that they could color in my pictures. It's very exciting to read the passages and have a mental picture immediately pop up in my head. I hope to continue to contribute artistically to this wonderful site."

Many have benefited from Johnson's contributions to this project (Fasimpaur, 2008).

In the context of project goals, an open educational resource project must make decisions about finding and utilizing non-monetary incentives to engage as many participants as possible. Utilizing student volunteers in production, decentralizing support responsibilities across the group of users, and leveraging organizational rewards for participation are all ways of reducing costs, though they come with some tradeoffs (Wiley, 2007).

In my experience, using and creating OER should always involve a specific purpose. In our case, we wanted to teach people how to use wikis and blogs in the classroom, and we tried to focus on that topic



(Gardner, 2008).

“How much is enough?” Intellectual property concerns, faculty and institution preferences and publishing level of effort generally dictate that only a subset of the materials used in a given class will be published via an OCW site. How much, then, is enough to provide significant value to end users?

This answer differs from project to project, often based on the audience that is of most interest to the publishing institution. For a school interested in supporting independent learning, a more complete set of materials is required. For a school interested in providing resources for educators and enrolled students, often less material from a course is still very useful, especially if this permits materials from more courses in total to be published, providing a broader view of curricular structures. The trade off here is almost always depth vs. breadth (Williamson, 2007).

...Most Moodle teachers use it [Moodle] to post static resources with little thought to how to change their teaching. They use the technology to amplify their old, inefficient methods. A smaller number use it to slightly modify their delivery, moving some tasks out of the classroom. And then a very few understand the potential revolution and transform their classroom practice in extraordinary and powerful ways (Cole, 2007).

As product manager of FreeReading.net (a K-3 open source early literacy program), I am consistently amazed by the talents and generosity of the FreeReading community. Since our launch last fall we’ve seen hundreds of lessons, illustrations and literacy songs posted on the website. In addition, over the last year, the FreeReading development team has met with dozens of teachers to spread the word about FreeReading, pilot the program and solicit feedback. FreeReading has clearly become a vibrant community of educators and researchers that truly care about sharing best practices and helping children learn to read for FREE.

We hope that the FreeReading community will continue to grow, extending it, adapting it and sharing its successes with teachers across the globe making it the “GNU/Linux” of early literacy education! As a former English teacher who had limited resources while teaching

abroad, open source education resources are a dream come true. I hope that the energy and momentum around projects like FreeReading, OER Commons, and Curriki will grow exponentially as more educators learn about the open source education movement. (Batchelder, 2008)

## SOURCES

Cole, J. (2007, April 13). One Moodle per child? Using Moodle: Thoughts and musings on Moodle and Open Education. Retrieved May 21, 2008 from <http://usingmoodle.blogspot.com/2007/04/one-moodle-per-child.html>

Fasimpaur, K. (2008, April).

Gardner. (2008, May 1).

Wiley, D. (2007). On the sustainability of open educational resource initiatives in higher education. Paper commissioned by the OECD's Centre for Educational Research and Innovation (CERI) for the project on Open Educational Resources. Retrieved May 13, 2008, from <http://www.oecd.org/dataoecd/33/9/38645447.pdf>

Williamson, W. (2007, August 21). How much OCW is enough? Wide Open Education. Retrieved May 21, 2008, from <http://oedb.org/blogs/wideopen/category/opencourseware/>

Batchelder, A. (2008).

*Space for Personal Notes*



*Image courtesy of "helmet13" on Flickr*



# Adapt

to address different needs

In this chapter

QUALITY

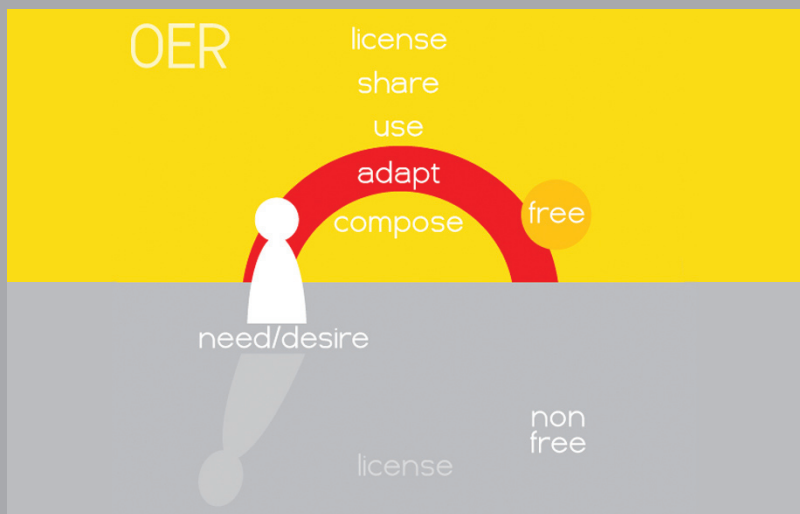
OER TRANSLATION

OFFLINE VERSIONS

ACCESSIBILITY

PERSPECTIVES

Image courtesy of Sunshine Connelley



# Adapt

## REVISE AND REWORK OER

Adapting OER includes inserting and removing components, changing the sequence of learning activities, editing and remixing images, text, audio and video, etc. to suit the style of the educator and match the requirements of the learners.

Reasons to adapt an OER include:

1. To address a particular teaching style or learning style
2. To adapt for a different grade level
3. To adapt for a different discipline
4. To adjust for a different learning environment
5. To address diversity needs
6. To address a cultural preference

7. To support a specific pedagogical need
8. To address either a school or a district's standardized curriculum (ISKME, 2008)

## EXAMPLES

- ▶ A teacher translates a web page about Queen Elizabeth from English to French.
- ▶ A teacher replaces pictures depicting Russian children working on a water project with images that are more familiar to her students in Ghana.
- ▶ A teacher changes some wording in a 4th grade unit on spaceflight to make it better suited for his third grade students.

## LOCALIZATION

This handbook emphasizes “localization:” adapting an OER for a specific locale including translation, modifying the formats of dates and currencies, and recontextualizing the OER to be more meaningful for the learners in the local context. The context may be as different as a classroom on another continent, or as similar as another class in the same school.

## INTERNATIONALIZATION

Localization (l10n) goes hand-in-hand with internationalization (i18n). Whereas l10n is concerned with adapting OER for the local context, i18n is concerned with adapting OER for use in multiple locales.

As you look at your materials for possible OER, consider what adaptation would need to take place for teachers in other classrooms. Then, ask yourself if these materials need to be changed to reduce the

amount of time other teachers would need to adapt the material for their classrooms.

## REFLECTION

Questions to think about:

- ▶ Does the resource specifically mention individual class members or groups?
- ▶ Does the resource specifically reference local buildings, landmarks or people?
- ▶ What sort of local traditions and customs does this resource follow?
- ▶ Is there anything about the content that was custom designed?

These questions for self-reflection are not meant to advocate that all possible OER should remove any sort of local “flavor” from it. In fact, in some cases it’s better to leave elements intact, because they can make the OER more interesting and exciting. Additionally, you should not try to make an OER applicable to every possible use. Such OER would likely be useless to most people because they would be too vague.

## REFLECTION

As you review the answers to your questions above, consider the following:

- ▶ How important are the localized parts of the resource to its educational value?
- ▶ How interesting are the adapted parts?
- ▶ What would happen to the resource if the localized parts are taken out?



- ▶ Can the adapted parts be substituted without a reduction in educational value?
- ▶ Can the adapted parts be substituted without reducing the appeal of a resource?

Adjusting the amount of adaptation in your own materials as you prepare them to become OER is a matter of balance. You want to adjust your resources enough to be valuable to a wider audience, without taking out information that is useful or interesting. One of the difficulties in addressing these issues is that you can never tell exactly who will use your materials. The most helpful advice that can be given is to carefully review your material and use your own judgment. As a teacher you know the requirements of the classroom best, and should be able to decide best how to make a resource useful to other teachers.

## SOURCES

ISKME. (2008, February 8). What is localization? Connexions. Retrieved March 21, 2008, from <http://cnx.org/content/m15222/latest/>

Image courtesy of “visualpanic” on Flickr



# Quality

Most OER projects draw material from several sources reaping the benefits of a wider selection and multiple perspectives. For a quality result, pay attention to the following while adapting an OER.

If the license associated with the resource you wish to use disallows derivative works:

- ▶ Provide an introduction describing the resource, including any terms or conditions for its further use.
- ▶ Bring in additional information to contextualize the resource by wrapping it around the resource (rather than placing it within the resource).

Alternatively, select another resource that does allow derivatives and consider the following.

## CONTEXT

Material from different sources may be pulled out of context and need to be adapted for the target environment in a consistent manner. One approach is to gain a good understanding of the role of the component in its original context before adapting it for the new context and incorporating it into your OER.

## CONTINUITY

Continuity can be disrupted if the OER jumps around as a result of being composed from a number of different sources. To prevent this from happening, review your entire OER from beginning to end. Have colleagues, friends or learners review the information to determine whether or not there are any problems with the logical flow.

## TERMINOLOGY

Terminology may be undefined, or certain phrases may have a unique meaning in the source (e.g. learning object). Find any terms, phrases or examples that are not mentioned in any other source. Decide whether or not to include them, or if some explanation is needed. Identify any informal or slang terms. Depending on how you want to present these materials you may or may not elect to keep them. Use your word processor's "find and replace" feature when changing words or phrases.

Consider adding definitions as text in video used, if it is not defined by the video itself. Definitions for audio may be included in a separate text file or web page.

## PRESENTATION

The manner in which the sources are presented will likely differ. For example, two sources might use a different font, or some images might have a border around them, while others do not. For audio, some sound clips might have louder volume than others and may need readjustment using an audio editor. Likewise, images could be altered using an image

editor[1].

## TONE AND VOICE

Existing OER and other educational material vary in style. Consider the tone and voice (first, second or third person). Often the necessary changes can be made by altering only a few words in some of the material. However, this type of inconsistency can be a source of frustration. Nonetheless, having a consistent tone and voice is essential, as learners may be distracted by inconsistencies.

For audio and video, changing tone and voice may be impossible. In those situations, carefully consider if a source is too incongruous for inclusion into the OER.

## MANAGING THE AUTHORING PROCESS

Adapting and remixing resources has its challenges. If a resource is licensed in such a way that it prevents derivatives, you may have even less flexibility. However, there are some things you can do to mitigate any problems you might have.

1. Decide on an overall organization of the material as well as the tone and voice. Then modify all source material to match those prescriptions.
2. Modify all material to match whatever tone and organization is followed in the majority of the other sources.

Each option has its own considerations. The first option is best when there is no single source that is used in the majority of the material. The advantage of having one overall plan is that you know the context in which your course is used and plan accordingly. However, you should keep in mind that adapting resources takes time and if your overall goal requires heavy modification, you should plan on spending significant time on reaching it.

The second option is best when there is a single source that is used in

the majority of the course. The advantage of modifying all material to match the majority is that it saves time. Unfortunately, this option may not work if the major source's tone and content is far removed from what learners need.

## KEEPING TRACK OF SOURCES

As a matter of good academic practice, all citations used should be tracked. Some OER licenses also require attribution as one of their terms of use. It can be a challenge to keep track of all the sources in an OER, as it may include a combination of audio, video and text. Keep a spreadsheet or text document that lists the source, format (audio, video, etc.), license and where it is used in the OER. Keeping files in separate folders according to their license may be a helpful way to keep track of material and prevent mixing two sources that have license incompatibilities. The licensing chapter will discuss how these sources are attributed within the OER itself and issues regarding license incompatibility.

## WHEN NOT TO REMIX

Remixing resources is not always necessary. In some instances reusing an OER “as-is” can be beneficial. For example, the producers of USU OCW’s English 1010 course[2] deliberately kept its opinion pieces distinct in tone, voice and terminology so learners could compare and contrast the differences.

Depending on the time and resources you have available, complete adaptation may not be possible. In those situations, you should recommend further modification of the OER for more effective use.

## NOTES

1. See *Audio programs* and *Image editing programs* in *Compose* for possible tools.
2. <http://ocw.usu.edu/English/english-1010>

Image courtesy of “creativecommons” on Flickr



# OER Translation

While it is difficult to determine the quality of an OER in another language, it is not uncommon for an OER to be translated. While there are some large translation efforts, such as the move to translate MIT OCW material into Chinese, most OER translation occurs on an “as needed” basis. Be aware that material with a Creative Commons “No Derivatives (ND)” clause disallows translation (Hatcher, 2008).

Translation can be a time consuming process. Before beginning a translation, make sure there isn’t equivalent material in the target language already. Usually OER producers will note whether or not their OER is available in multiple languages. The next step is to contact the OER developers to see if they would like to assist in the translation. Having the OER developers assist can be tremendously helpful, because they understand the original meaning and intent of the OER. If the OER developer is not bilingual or is unavailable, look for someone who understands both the original language and the target language very well.

Typically translation occurs in two passes. The first is a quick, rough translation. In some instances this can be done through various language translation websites, such as Google Translate[1]. As most machine

translations will leave inaccuracies that require human intervention, a second translation is inevitably needed. Post your request for a translator to message boards that match the subject area. Another possible pool of translators is local students. If you are at a university or college, or one is located nearby, they will likely have a diverse student body with students who can speak multiple languages.

Once you find a translator, have them look at a rough translation, with the original OER also available for reference. Once the translator is done with the second translation, consider a back translation (by a different translator) before having someone who represents target learners check the OER to see if it makes sense. Revise as needed.

For some types of OER (e.g., those with highly specialized vocabulary) it is vital to select excellent interpreters with a sound knowledge of the subject area in both languages.

## NOTES

1. ↑ <http://translate.google.com/>

## SOURCES

Hatcher, J.S. (2008, February 14). “English subs, worldwide audiences, anime, and open content.” Opencontentlawyer.com. Retrieved March 21, 2008, from <http://www.opencontentlawyer.com/2008/02/14/english-subs-worldwide-audiences-anime-and-open-content/>



*Image courtesy of “milovan” on Flickr*



## Offline Versions

“Offline” or “local” versions of OER are OER that can be used without being connected to the internet. Bandwidth is limited in many countries and there are places that have very little access to the internet or where internet access is prohibitively expensive, even in so-called “developed countries” like the United States (Associated Press, 2008). For educators in these areas, “offline” versions of OER are tremendously valuable.

Local copies of OER save on bandwidth costs and greatly increase the speed at which users can access the resources. Having a local copy of the materials also enables new ways of modification and collaboration in the local context. For example, copying a course from MIT OCW into a local wiki enables a teacher to assign students to update and modify the course materials to make them more locally relevant.

To enable offline access to your OER, make the OER (or as much of it as possible) available for download in a format that is convenient for re-use and modification, and under a license that permits adaptation.



Offline-ready resources include:

- ▶ Downloadable pictures, audio, and video files
- ▶ Text pages that can be understood without following embedded hyperlinks
- ▶ OER packaged in digital form according to open standards (e.g. for use in a local LMS).

Resources which require modification for offline use include:

- ▶ Streaming video and audio
- ▶ Flash-based resources that cannot be downloaded
- ▶ Text pages that require following some/all of the links to make sense

## METHODS TO PROVIDE OFFLINE OER

There are a number of ways local copies of materials can be provided:

### *Web-site mirror*

A mirror is an (exact) copy of a website. Some popular web-sites are hosted on mirrors across the world to reduce the access times for users from different regions. Static mirrors are one-time snapshots of an existing website. Dynamic mirrors are usually “seeded” with a substantive amount of content copied from the original server, and then updated dynamically based on user requests when an internet connection is available. For example, if a user in the local network requests a web page that has not been copied to the local mirror, then it has to be downloaded from the international site. At the same time it is added to the local mirror, so that the next user accessing the page, will get the

(now available) local copy, saving additional trips to the international server.

### *Web proxy / cache*

A proxy server acts as a “middleman” between a user and a resource. A proxy server can be used to filter access to unwanted resources (e.g., block users on a university campus from accessing music download sites), but it can also be used to direct users to local copies of web resources. This can be done in a way that is invisible to the user, who is not aware if she is accessing the original resource or seeing a local copy of it. The user types in the URL for the web site he or she is interested in, and the proxy server decides if the content is sent back from the local copy or has to be downloaded from the international server first.

### *Printable resources*

Some OER sites provide features to generate resources in a printable format (such as PDF). This is most useful for educators with occasional access to be able to print copies for learners without access to the internet.

### *Copying content*

A labor intensive process of copying materials from websites into a local repository. This is the least attractive option for users interested only in accessing the materials, since it requires a great deal of customization to ensure that hyperlinks continue to work, and is unlikely to reproduce a user experience similar to accessing the original materials. However, if you want to modify and adapt materials, some form of copying into a different local system is generally required. Using some of the existing standards (described above) can make the process easier. For example, some courses from the MIT OpenCourseWare project can be downloaded as IMS Content Packages archives, which can then be imported into a local learning management system and modified there.

A number of tools allow automatic downloading of web content for local hosting and can also make the process significantly faster (see for example: HTTrack[1], wget[2] and curl[3]).

### *Mirror sites run by others*

Finally, there is a possibility that the resources you are looking for already exist as mirror sites on a network in your country or region, which can usually improve access speeds (and depending on the way your internet service provider(ISP) charges for access, reduce cost). For example, in South Africa the Tertiary Education Network (TENET)[4] hosts a mirror of MIT's OpenCourseWare repository[5]. Access speeds to this local mirror are much faster from university networks in South Africa than to the original MIT site.

Typically, large repositories of OER (such as Connexions or MIT OCW) offer their pages as a collection in ZIP format. ZIP is a type of file that actually works more like a folder; it can contain several different files that can be expanded using a unzipping program. A ZIP file uses compression to make the ZIP file smaller than the size of all the files put together normally, making ZIP perfect for distribution over the internet. There are several different ZIP programs such as 7-Zip[6] that you can use to unzip files in the ZIP format.

A simple way to test how well your OER works in an offline setting is by disconnecting a computer from the internet and trying use the OER. If it doesn't work, others may have a hard time making an offline copy of your resource.

## NOTES

1. <http://www.httrack.com/>
2. <http://www.gnu.org/software/wget/>
3. <http://curl.haxx.se/>

4. <http://www.tenet.ac.za/>
5. <http://ocw.mit.edu>
6. <http://www.7-zip.org/>

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Associated Press. (2008, April 4). Navajo Nation likely to lose internet service. Retrieved April 4, 2008, from <http://www.cnn.com/2008/TECH/04/04/navajo.internet.ap/>

Schmidt, P. (2007, November). "7.2 Local hosting of materials." UNESCO OER Toolkit Draft. WikiEducator. Retrieved March 21, 2008, from [http://www.wikieducator.org/UNESCO\\_OER\\_Toolkit\\_Draft#Local\\_hosting\\_of\\_materials](http://www.wikieducator.org/UNESCO_OER_Toolkit_Draft#Local_hosting_of_materials)



# Accessibility

*Since adaptation can involve both localization and remixing, accessibility is affected in different ways by adaptation.*

## ACCESSIBILITY OF CONTENT

The de facto standard for the accessibility of web-based content is the W3C WCAG (World Wide Web Consortium Accessibility Guidelines) [1]. However, it is important to note that the standards are not aimed at e-learning *per se*, so pedagogy and assessment, for example are not covered. Here are some of the basics of accessibility, which will need to be considered:

1. Accessibility should be considered at the very beginning of a project, because it is harder and more time-consuming to retrofit it.
2. Any HTML (HyperText Mark-up) code should be accurate and in accordance with the W3C HTML Specification[2]. Code should be marked up correctly, otherwise assistive technology, such as screen readers, which rely on the code being accurately written may not work properly. The W3C Markup Validation Service[3] will validate the code for free.

3. Fonts, colors, and presentation of the content should not be hard-coded - use CSS (Cascading Style sheets) instead (see the W3C CSS Specification[4] and the free automatic W3C CSS Validation Service). If presentational aspects of the content are hard-coded, they cannot be changed or individual style-sheets used.
4. Ensure images are tagged with “alt” text so that people who cannot access them can determine what they are.
5. Use common sense. While accessibility validators can determine whether certain elements are missing, they cannot determine whether the values actually make sense. For example, while an accessibility validator can determine whether “alt” text has been included, it cannot tell whether it describes the image accurately or is complete nonsense.
6. Usability is also important. A webpage which follows all the accessibility guidelines to the letter may actually be unusable for everyone.
7. Accessibility is not just about making resources accessible to people with disabilities, it is about access for all. Students who are trying to access a video resource in the library may not be able to access sound and may require the video to be captioned, in the same way that a deaf student would also need captions for the video.
8. Where it is not possible to make a learning resource accessible, an alternative should be available which meets the same learning objectives. For example, a person who cannot use a mouse may be unable to do a drag and drop exercise, therefore, an alternative exercise should be offered.
9. Use of Flash can be problematic. Advances have been made to make it more accessible (see *Best Practices in Accessible Flash Design* [5]) and work is still ongoing but depending on the complexity of the Flash object, alternatives may need to be offered.
10. There are e-learning accessibility guidelines and accessibility specifications available from IMS:

### *IMS ACCLIP (Accessibility for Learner Information Package)*

Specification Version 1.0[6] This specification allows preferences for content, display, and interface control to be recorded and described for all users, so that learning materials can be easily accessed from any location (e.g. school, home, office, library or while using mobile devices) in the way that the user requires regardless of physical, environmental or hardware limitations.

### *IMS ACCMD (AccessForAll Meta-data)*

Specification Version 1.0[7] This specification defines the metadata that can be used to describe a learning resource's accessibility and its ability to match a learner's preferences.

### *IMS Guidelines for Developing Accessible Learning Applications*

Version 1.0[8] These guidelines are a set of recommendations and resources that aim to make e-learning accessible to everyone regardless of ability or environment. Topics include: design recommendations; text, audio, images, multimedia; communication tools; interfaces and interactive environments; testing and assessment; and topic specific accessibility (e.g. math, science, music).

*Further information is also available from the JISC CETIS (Joint Information Systems Committee Centre for Educational Technology and Interoperability Standards) Accessibility website [9].*

*For more information, see LearningSpaces Accessibility of eLearning course [10].*

## LOCALIZING AND ACCESSIBILITY

Making an OER more accessible is a form of localization. But accessibility is also something to keep in mind as you localize OER for other reasons. For example, if you are translating audio from one language to another, you should make sure you have a transcript

available in the translated language for any persons with hearing impairments. Also, make sure any edits you make to a video are made to the transcript. Essentially, you should ask the following questions as you localize:

1. Have I localized in a way that excludes persons with disabilities from using the OER?
2. Is there anything I could be doing to make this resource more accessible to persons with disabilities?

In asking these questions, keep in mind the time and resources available to you. In some cases you may not be able to make the OER accessible in a timely manner. For example, a course with over fifty hours of podcasts may make transcript production by yourself impractical. Always use your best judgment in prioritizing your use of resources. Do the best you can.

## REMIXING AND ACCESSIBILITY

As with localization, accessibility should be kept in mind as you remix. The same guidelines that apply to localization accessibility also apply to remix accessibility. Transcripts or closed captioning for mashup videos should be kept consistent. The resulting remix should not be needlessly difficult for persons with visual impairments or any other disability to use. As you look for materials to remix, keep in mind which ones already have accessibility features as they will require less work on your part.

There are also technical accessibility considerations when remixing. For example, Windows Media requires a separate file for closed captioning, while QuickTime allows the file to be embedded within the video file. When remixing, think about the final format and how it will affect accessibility.



## NOTES

1. ↑ <http://www.w3.org/TR/WAI-WEBCONTENT/>
2. ↑ <http://www.w3.org/TR/html401/>
3. ↑ <http://validator.w3.org/>
4. ↑ <http://www.w3.org/TR/REC-CSS2/>
5. ↑ [http://www.macromedia.com/resources/accessibility/best\\_practices/bp\\_fp.html](http://www.macromedia.com/resources/accessibility/best_practices/bp_fp.html)
6. ↑ <http://www.msglobal.org/accessibility/index.html#acclip>
7. ↑ <http://www.msglobal.org/accessibility/index.html#accmd>
8. ↑ <http://www.msglobal.org/accessibility/index.html#accguide>
9. ↑ [http://wiki.cetis.ac.uk/Resource\\_List](http://wiki.cetis.ac.uk/Resource_List)
10. ↑ [http://openlearn.open.ac.uk/course/view.php?name=H807\\_1](http://openlearn.open.ac.uk/course/view.php?name=H807_1)

*Image courtesy of “circo de invierno ~” on Flickr*



# Perspectives

The obvious reasons are scarcity and cost of bandwidth in some parts of the world. For example, in 2004 “Denmark – a country roughly the size of Costa Rica - ha[d] more than twice the international Internet bandwidth than the whole of Latin American and the Caribbean combined” (ITU 2004). And a recent visitor to Tansania noted that he had roughly the same amount of bandwidth connecting his house in the US to the internet that the whole country shared. (Comment by Philip Greenspun during workshop at University of the Western Cape, August 2007.)

A community member of Wikibooks[1] created the Animal Alphabet book[2] there to help young children learn the alphabet. The book features colorful photos that were taken from open sources such as Wikimedia Commons and Flickr. After being downloaded, the photos were cropped and resized. Text for each alphabet letter was added. The resulting images were then uploaded to Wikibooks and compiled into the Animal Alphabet book.

Taking that project a step further, another Wikibooks community member remixed the animal alphabet book to create a variety of

formats, such as ebooks and videos. These can be used on a variety of hardware platforms (handhelds, iPods, cell phones, etc.) and both online and offline. The videos included music from an open licensed symphony performance and narration that was recorded by the creator. One of these videos was also uploaded to the TeacherTube[3] web site where it has since been viewed over 7,000 times. Converting the Animal Alphabet book to a video was a relatively easy task that only took a few hours, but the resulting remix adds a whole new dimension to the content. Creating and remixing this OER was a rewarding task for the creators and provided a useful resource for teachers, kids, and parents around the world (Fasimpaur, 2008).

It occurs to me, as I've said before, that as a field we don't have expertise in the localization process. And by localization, I mean not only translation, but also things like replacing inappropriate media (e.g., pictures of little anglo kids getting of a school bus on a snowy day when you're using content in Africa) and aligning examples, metaphors, and other socioculturally-loaded bits with the local context (Wiley, 2005).

We really wanted to create something that was entertaining, as well as informative. It seems that mashups have high potential for being humorous, and we went out of our way to utilize that potential. When the creative process was done, we ended up with a video of Kennedy and Nixon debating the pros and cons of blogs and wikis[4]. This entertainment factor is what makes OER's so fun (Gardner, 2008).

Structured data exchange of this sort[using XML] is critical to the future of OER and the elearning economy, but by far the wider community is that of teachers and academics, for whom the remix tool of choice is their word processor. This makes the remix data format of choice a textual, prose file — in other words, the linear, print version that we now offer for our OER, which they can copy and paste into their editor (Dewis, 2008).

Remix happens in an environment in which users/consumers have the capacity to do more than the programmers/producers had planned or even imagined. An architecture that supports remix is an architecture that can be inflected by educators—even (or especially) non-programming educators (Feldstein, 2005).

...we should also be talking about how to ensure that we are using more

open courseware, as well as producing it. Why is it that our faculty and learning designers tend to create new content rather than using, modifying, and reusing content that has already been made available and licensed for open use? Obviously there is some of this going on, but why so little, particularly given the cost associated with developing online courses (Udas, 2008)?

## NOTES

1. ↑ [http://en.wikibooks.org/wiki/Main\\_Page](http://en.wikibooks.org/wiki/Main_Page)
2. ↑ [http://en.wikibooks.org/wiki/Wikijunior\\_Animal\\_Alphabet](http://en.wikibooks.org/wiki/Wikijunior_Animal_Alphabet)
3. ↑ <http://www.teachertube.com>
4. ↑ <http://www.youtube.com/watch?v=AsFU3sAIPx4>

## SOURCES

Dewis, L. (Last Updated 2008, April 14). OER stories:OpenLearn, The Open University. OER Wiki. Retrieved May 14, 2008, from [http://oerwiki.iiep-unesco.org/index.php?title=OER\\_stories:OpenLearn%2C\\_The\\_Open\\_University](http://oerwiki.iiep-unesco.org/index.php?title=OER_stories:OpenLearn%2C_The_Open_University)

Fasimpaur, K. (2008).

Feldstein, M. (2005, October 11). Does Education Inflected Architecture = Web 2.0? Retrieved May 22, 2008, from [http://www.mfeldstein.com/does\\_education\\_inflected\\_architecture\\_web\\_20/](http://www.mfeldstein.com/does_education_inflected_architecture_web_20/)

Gardner, J. (2008, May 1).

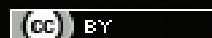
Wiley, D. (2005, September 27). Thoughts from the Hewlett Open Ed Grantees Meeting. Iterating Towards Openness. Retrieved May 14, 2008, from <http://opencontent.org/blog/archives/192>

Udas, K. (2008, May 12). Doing OER and OA: More Questions than Answers. Open Students. Retrieved May 29, 2008, from <http://www.openstudents.org/2008/05/12/doing-oer-and-oa-more-questions-than-answers/>

*Space for Personal Notes*



*Image courtesy of "Northern Xander" on Flickr*

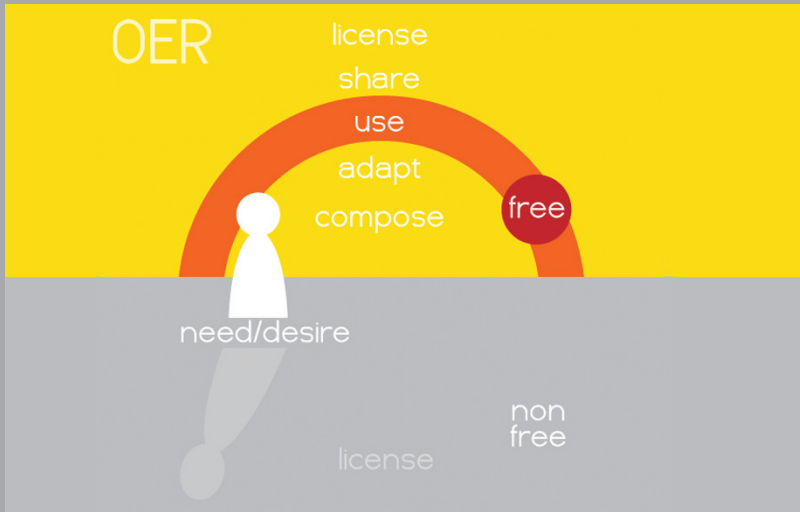


# Use

flexibility in the classroom

In this chapter

INTEGRATING OER IN TEACHING + LEARNING  
LEARNER PERSPECTIVE  
EDUCATOR PERSPECTIVE  
USING MOBILE VERSIONS  
EVALUATION  
ACCESSIBILITY  
PERSPECTIVES



## Use

The first step to using OER is successful integration into teaching and learning. This step is important, as the OER being used should fit in well with the surrounding instruction. In order to successfully merge an OER into teaching and learning, this chapter will consider the perspectives of both the educator and learner. Both have different ways in which they can derive benefits from and contribute to the OER community. As you are using OER, make sure to evaluate its quality. As stated earlier, the ultimate goal of OER is to improve access to learning opportunities by sharing knowledge and learning resources. The evaluation that takes place during this part of the OER life cycle is critical in determining whether a particular OER meets that goal.





# Integrating OERs in Teaching and Learning

Little is known about how OER can be included as source materials for learning, or created by students and teachers as part of the learning and teaching process. Some institutions are using and producing OER as part of innovative teaching practices, but research on the impact on quality of education, and the ways we can assess students and quality is only starting to emerge. In the literature on OER and learning (see for example Downes, 2005; Keats and Schmidt, 2007) different strategies for supporting and using OER from the perspectives of lecturers and students are described. However, there is as of yet little analysis and understanding of how positioning learners as participants in a global knowledge commons, rather than seeing them in clearly defined roles as students and teachers within disciplines and institutions, will change the

way higher education functions (Schmidt, 2007).

Use of OER can be roughly divided into two perspectives: Learner and Educator. Some are concerned that OER isn't facilitating learner-centered instruction (Geser, 2006). How much of this learner centricity is generated by prevailing notions of a "better" method of teaching and how much is based on actual research is unknown.

On a conceptual level, using an OER is similar to using proprietary materials. After all, the reason you use these materials in the classroom is because they have educational value for your students. However, OER are different in that they allow for extra flexibility in the classroom.

There are eight steps to OER integration.

1. Assess the validity and reliability of the OER.
2. Determine placement within the curriculum, if not already done. Note that some OER integration may be abandoned at this point if the OER relates poorly to the rest of the curriculum.
3. Check for license compatibility[1].
4. Eliminate extraneous content within the OER (assuming the license permits derivatives).
5. Identify areas of localization[2].
6. Remix with other educational materials, if applicable[3].
7. Determine the logistics of using the OER within the lesson. For example, you may need to print handouts for learners. In other cases special software may be needed.
8. Devise a method of evaluation or whether the currently planned evaluation needs adjustment[4].

This handbook has discussed how you, as an educator, can compose and adapt OER for your class. But it has not yet discussed how learners themselves can engage in the OER life cycle. This is a powerful teaching opportunity as it empowers students to take part in their own learning. Another result of this flexibility is the option to have students publish the material.

## HOW DO I ENCOURAGE STUDENTS TO ENGAGE WITH OER?

Lessons can be centered around the modification, and perhaps improvement, of an OER. For example, you might have students edit a Wikipedia article based on information they learn during lectures and research. Another example might include students taking pictures from the Internet Archive to create a collage around a theme (e.g. Civil Rights movement, World War II). The exact way in which you have students compose and adapt OER will vary with the subject material and what will best promote learning for your students.

## REFLECTION

- ▶ Is the activity relevant to the resources being produced?
- ▶ Will students see this as a meaningful activity?
- ▶ Is the activity grade-appropriate?
- ▶ Are the tasks equally divided among the class or group?
- ▶ Will students have enough information to meet the objectives?
- ▶ What are the technical requirements (e.g. both hardware and software for the localization/remix)?
- ▶ Is there sufficient time for the adaptation?

## NOTES

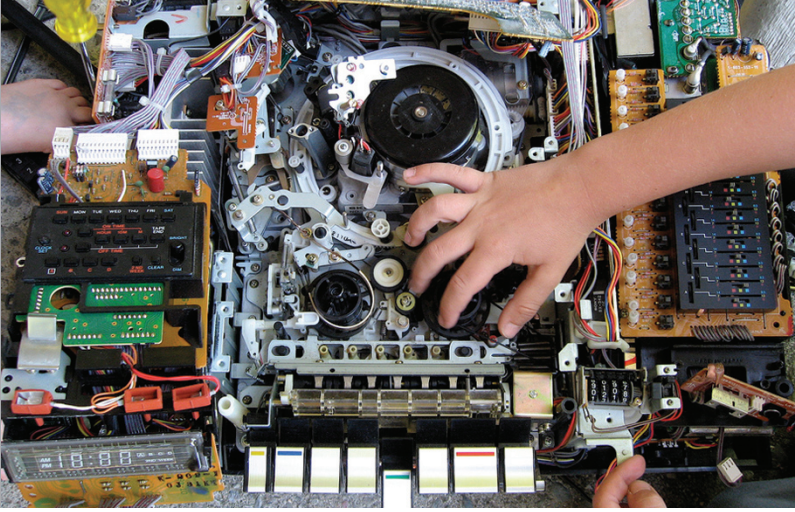
1. See *License Compatibility* in *Licensing chapter*.
2. See *Adapt* chapter.
3. See *Adapt* chapter.
4. See *Evaluation* chapter.

## SOURCES

Downes S. (2005). “E-learning 2.0.” eLearn Magazine. Association for Computing Machinery. Retrieved June 18, 2008, from <http://www.elearnmag.org/subpage.cfm?section=articles&article=29-1>

Geser, G. (Ed.). (2006, January). Open Educational Practices and Resources - OLCOS roadmap 2012. Retrieved May 29, 2008, from <http://www.olcos.org/english/roadmap/download/>

Schmidt, P. (2007, November). “7.3 Integrating OERs in teaching and learning.” UNESCO OER Toolkit draft. WikiEducator. Retrieved March 26, 2008, from [http://www.wikieducator.org/UNESCO\\_OER\\_Toolkit\\_Draft#Integrating\\_OERs\\_in\\_teaching\\_and\\_learning](http://www.wikieducator.org/UNESCO_OER_Toolkit_Draft#Integrating_OERs_in_teaching_and_learning).



# Learner Perspective

Learners can derive their own unique benefits from using OER and promote their use through the following types of activities (within the constraints of applicable licenses):

- ▶ Sharing lecture notes (and audio recordings), exam texts, and model answers with other students (on public web-sites) can create useful knowledge repositories that support study efforts.
- ▶ Encouraging educators to use OER readings where good alternatives to proprietary textbooks and articles exist; and using Google Scholar[1] to identify open versions of closed materials.
- ▶ Writing summaries of academic articles that are read during

course work, and sharing them with peers on public websites to enable access to some of the knowledge that would otherwise only be available through closed journals and publications.

- ▶ Using social bookmarking[2] and ranking tools to evaluate usefulness of resources; building social recommendation networks that make finding good resources easier.
- ▶ Reviewing published OER can help potential students determine which institution offers courses that best fit their interests. Once enrolled, looking through course descriptions helps them choose the courses they want to take.
- ▶ Not just educators, but students are benefiting from opening up their own work to an international audience for feedback and comment. Having a public blog or participating in online discussion forums is one way to showcase their work. In a more formal academic environment, publishing in open access journals ensures maximum visibility.

There have been several projects in which students have made their OER available[3].

Example student projects:

- ▶ The OpenWater Project  
*<http://www.openwaterproject.org>*
- ▶ Blogs and Wikis in Education  
*[http://www.opencontent.org/wiki/index.php?title=Using\\_Blogs\\_and\\_Wikis\\_in\\_Education](http://www.opencontent.org/wiki/index.php?title=Using_Blogs_and_Wikis_in_Education)*
- ▶ Interviewing Basics  
*<http://interviewingbasics.org/>*

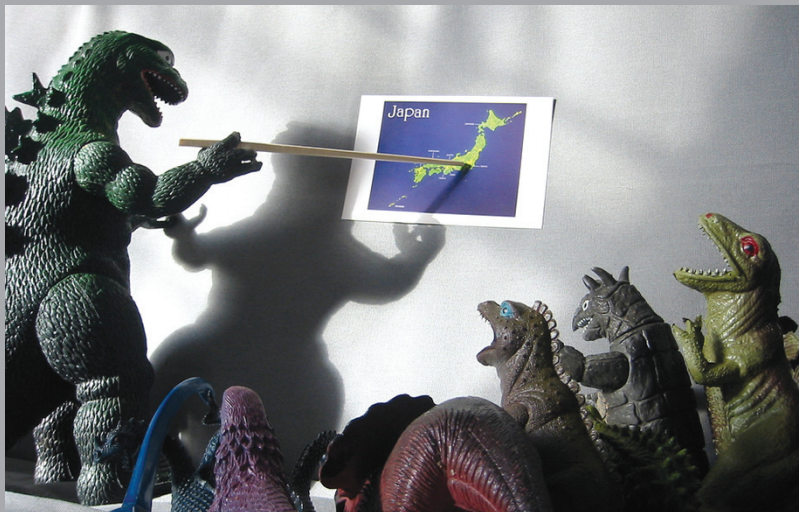
## NOTES

1. <http://scholar.google.com>
2. See *Self-publishing* in *Share* chapter)
3. See *Publishing Student Works* in the *Share* chapter for more information.

## SOURCES

Schmidt, P. (2007, November). “7.3.1 Learner perspective.” UNESCO OER Toolkit Draft. WikiEducator. Retrieved March 21, 2008, from [http://www.wikieducator.org/UNESCO\\_OER\\_Toolkit\\_Draft#Learner\\_perspective](http://www.wikieducator.org/UNESCO_OER_Toolkit_Draft#Learner_perspective)





# Educator Perspective

The educator perspective is the theme of this handbook - a manual for educators on how to develop and use OER. Here is a summary of some of the ways in which educators can use and promote OER:

- ▶ Adapting and extending existing OER for a local purpose.
- ▶ Choosing OER as part of the readings to support a growing international movement towards more and higher quality OER
- ▶ Publishing materials as OER by simply allowing public access to online courses (if e-learning is used) or archiving key materials on sites that offer free hosting (for example, flickr.com for images, slideshare.net for presentations, etc.)



- ▶ Sharing one's work in ways that makes it easy for others to access it and collaborate on adding more materials or examples.
- ▶ Translating the resources into other languages.
- ▶ Teaching in ways that encourage students to access and produce OER, and assess the quality of online resources.
- ▶ Experimenting with peer-based assessment models and reputation mechanisms familiar to the learners from social networking and e-commerce sites (e.g. rating each others' work based on five stars).

## SOURCES

Schmidt, P. (2007, November) "7.3.2 Lecturer perspective." UNESCO OER Toolkit Draft. WikiEducator. Retrieved March 21, 2008, from [http://www.wikieducator.org/UNESCO\\_OER\\_Toolkit\\_Draft#Learner\\_perspective](http://www.wikieducator.org/UNESCO_OER_Toolkit_Draft#Learner_perspective).

*Image courtesy of “zombiefactory” on Flickr*



# Using Mobile Versions

If the low bandwidth/mobile version of an OER has been developed properly, then using it should be easy.

## CHALLENGES

The most common problem with low bandwidth OER is that they still require too much bandwidth to download in a timely manner. If that situation occurs the best practice is to continue the lesson, but factoring in additional time for completion. In other situations, it is best to abandon the OER entirely, depending on the severity of the problem. After the lesson, you should evaluate the OER to see how it could be streamlined to require less bandwidth.

Reducing bandwidth in these situations often means shrinking images, breaking up pages of text or re-encoding video for smaller file sizes. It is always recommended that you try out your lesson using the available

bandwidth before using it in the classroom.

Another common problem with mobile versions of an OER is device incompatibility. As mentioned earlier, there is no way you can test for all possible mobile devices. Therefore, you should focus on testing mobile devices that will be used during the lesson. Ideally, all learners would be using the same mobile device, but that is not always possible.

Another problem with mobile OER is the time taken for learners to become familiar with its use. Although mobile phone use is common among younger learners, not everyone knows how to use their phone's mobile browser, or can use SMS text messaging features. Before using a mobile version of an OER, make sure learners understand how to use their mobile device.

## OPPORTUNITIES

Once the above hurdles have been cleared, there are exciting opportunities for blended learning which includes the use of mobile devices. Paradoxically, some of the approaches overcome lack of access to computers and the internet by using the cell phone as an alternative channel. Innovative educational mobile applications/services include:

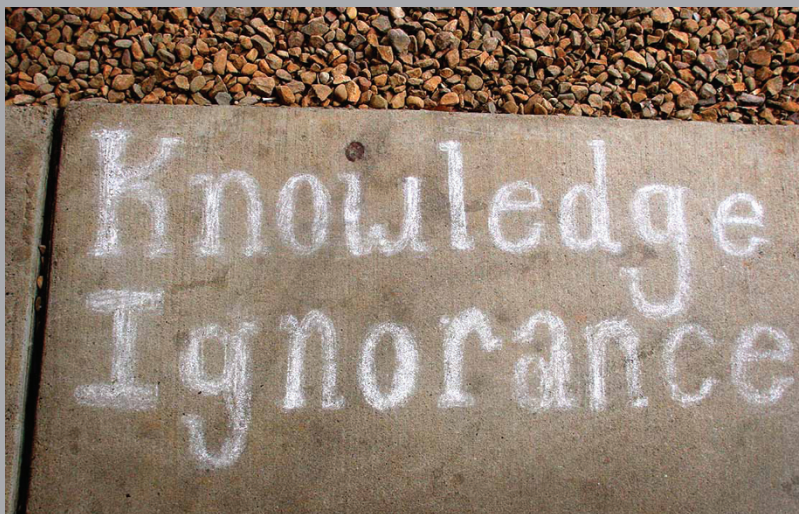
- ▶ MobilED[1] - accessing Wikipedia and other web sites via mobile devices and text to speech.

## NOTES

1. <http://www.mobiled.org/>

Retrieved from “[http://www.wikieducator.org/OER\\_Handbook/educator\\_version\\_one](http://www.wikieducator.org/OER_Handbook/educator_version_one)”

*Image courtesy of “babasteve” on Flickr*



# Evaluation

Previous chapters have discussed the concept of quality in OER production. Once you have used the OER, you should take the time to evaluate its quality. This recommendation may seem obvious, but evaluation is often neglected as time constraints often push educators to the next task. Simple OER, such as using a single page from a MIT course, may only need a basic evaluation. Thorough evaluation for complex OER can take enormous amounts of time and be difficult to set up. However, it is critical that you determine whether or not the OER is effective in the classroom.

## METHODS OF EVALUATION

There is no single method of evaluating OER quality or its effectiveness in the learning activities involving it. For many educators, the most important thing to measure is the learning outcomes. This part of evaluation is routine, since you are already evaluating learners on what they have learned. Although learners failing to acquire the knowledge

and information does not mean the OER is faulty, it does raise questions about its effectiveness.

Another metric for evaluation is learner reaction. In addition to finding out whether or not learners liked the OER, find out the “whys” behind their preferences. Although the composition of classrooms change over time, you should start to see patterns in the preferences of students. This evaluation can take the form of a paper survey, in-class discussion or focus groups. Which method you chose will depend on the time you are able to devote to evaluation.

The third metric is a difficult one to measure, but it is what is often called “return on investment (ROI).” The concept of ROI essentially asks “Was it worth the investment?” In order for measurement to be fully accurate, you need take into consideration the time taken at each part of the OER life cycle. This metric is largely subjective, as only you can measure how much your time is worth. You’ll probably find that your first OER will take more time than you originally thought. It is not uncommon to have technological issues during the first implementation. This should not discourage you from future OER production and use; as you develop new skills and refine others the amount of time needed will be reduced. You should also consider how much time it would have taken you to build the OER from scratch in relation to the other costs of proprietary solutions.

Consider submitting your OER to a repository that offers ratings and comments. Though these ratings and comments take time to accumulate, it can be a good way to poll the opinions of others. Popular repositories for rating might include:

- ▶ Wikipedia[1]: add to an existing article or create a new one.
- ▶ WikiEducator[2] and Wikiversity[3]: add a new project and connect with fellow educators.
- ▶ Flickr[4]: no ratings, but users frequently comment on photos and some users have groups that recognize outstanding photos.
- ▶ Kaltura[5] / TeacherTube[6] / YouTube[7]: registered users can

rate and comment. YouTube's recommendation system will suggest similar videos. Kaltura allows others to edit and make improvements to the video.

- ccMixer[8] and The Freesound Project[9]: upload music to ccMixer and sounds to Freesound project. Commenting systems on both sites.

You should not be afraid to decide against developing a particular OER project in the future. There are many good ideas for OER projects that simply are not feasible at this point in time given the amount of time needed. Start with simple OER exercises and projects and take on more complex ones as your confidence grows over time.

## NOTES

1. <http://en.wikipedia.org>
2. <http://www.wikieducator.org>
3. <http://www.wikiversity.org>
4. <http://www.flickr.com>
5. <http://www.kaltura.com/>
6. <http://www.teachertube.com/>
7. <http://www.youtube.com>
8. <http://ccmixter.org/>
9. <http://freesound.iua.upf.edu>



# Accessibility

Previous sections have discussed accessibility when finding and creating OER. But accessibility also plays a role in the actual use of the OER. When using an OER in the classroom it is important to follow-up on accessibility. How you follow up will largely depend on the needs of your individual classroom. For example, if you have learners who are utilizing closed captioning, check with them to see whether the text is legible. Other examples might include whether everyone can see all the elements of an OER (e.g. text is too light, colorblindness). You can never be quite sure what types of accessibility issues may crop up during the use of an OER, so be prepared to change extemporaneously. Talk with your learners about how the OER can be adjusted to meet their needs.

The important thing is not to be discouraged by accessibility issues when using an OER. Accommodating persons with disabilities can take time and it is understandable if you are not aware of accessibility issues initially. If you are uncertain how to resolve accessibility issues, contact persons with disabilities staff at your institution.



## ACCESSIBLE ASSESSMENT

Online assessment also needs to be accessible and it is important to determine what exactly is being assessed (e.g. is the student's understanding being assessed or the student's ability to use the technology). The JISC CETIS website has a series of webpages on Accessible Assessment[1], which covers:

Guidelines and specifications for accessible assessment

- ▶ Accessibility legislation relevant to assessment;
- ▶ Accessibility issues for assessment;
- ▶ Exam arrangements and strategy for accessibility.

### NOTES:

1. [http://wiki.cetis.ac.uk/Accessible\\_assessment](http://wiki.cetis.ac.uk/Accessible_assessment)





# Perspectives

The need to adopt stringent peer review for OER[s] in quality assurance is very crucial. This should be integrated throughout the processes from creation, development, dissemination and utilization. The Quality of OER[s] is still questionable and this still ties up with the question of in country policies in education (Rasugu, 2008).

I fear that some existing OER efforts are driven by some other motivations than learner need. Some of those “other” reasons include:

- ▶ Altruism,
- ▶ Public relations,
- ▶ Publicity,
- ▶ Collaboration on shared interest projects, and
- ▶ Survival (don’t miss the OER train).

While likely valid drivers, these are supply side only drivers. While it is hard to criticize altruism, altruism for the sake of altruism does not guarantee need by the recipient. Further, availability does not guarantee need by the recipient. Some OER models are comparable to all you can eat food buffets. The supply is plentiful, but there is only so much one can consume, only certain things that you want to consume, and much of the time you would prefer to order what you actually want a la carte. Do we really know if learners want to consume large quantities of content (an entire course)? Is it possible that the learner really only wants certain items when s/he wants them? If so, are learners more likely to want the “special order” items such as specific research reports vs. the plentiful belly-buster items that make you full, but a little queasy (like 90 minutes of audio captured from a lecture hall) (Maddrell, 2007)?

When Professor [McCabe of Saint Michael’s College] initially sent us the tutorial assignment on Wiki I felt completely overwhelmed and nervous about the upcoming semester. I was very unsure if I was going to be able to keep up with the curriculum and worried. But as I got more familiar with the program and worked on developing our own Wiki’s, the web page became more of a comfortable and inviting for me. I became very excited about using the resource for teaching ideas and I love contributing to our own educational science work page. I am very excited about my future classrooms where I will be able to use some of the many excellent ideas of my classmates and I hope that teachers today have the chance to experience some of our ideas with their students (Martin, 2008).

In terms of rural learners, in addition to geographical isolation making getting to classroom based courses difficult, our rural learners have less access to many of the things that support learning, such as the ability to discuss their ideas and issues with others with the same interests, lack of libraries, and even good quality Internet access. Many of our rural learners haven’t learnt how to utilise online information resources, such as the Internet, and see the Internet as really only useful for transactions such as purchasing and banking. Often their learning skills can be poorly developed in that they depend on a teacher to fill them with knowledge, rather than taking the initiative and responsibility for their own learning (this is usually a function of their age and/or lack of educational success), and it means that they rely more heavily on teacher led learning (Mahler, n.d.).

## SOURCES

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*Image courtesy of "Bob Jagendorf" on Flickr*



# Share

greater potential with collaboration

In this chapter

SELF- OR THIRD-PARTY PUBLISHING

SELF-PUBLISHING

THIRD-PARTY PUBLISHING

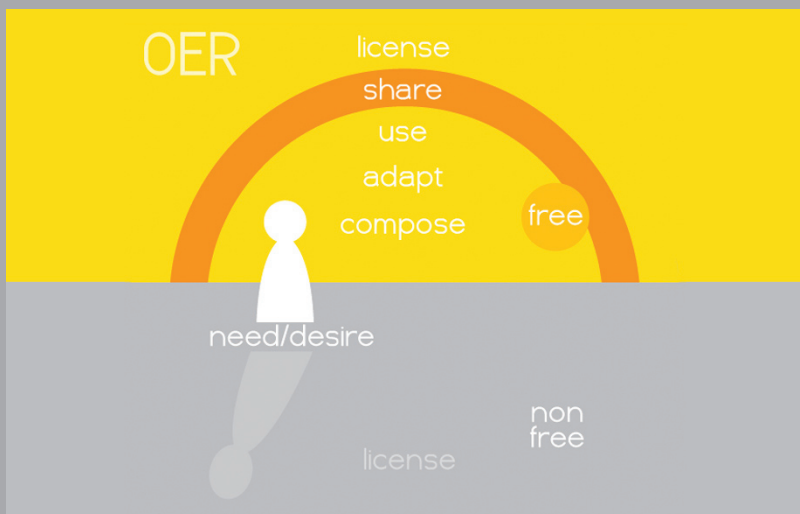
LINKING BETWEEN VERSIONS

PUBLISHING STUDENT WORK

ACCESSIBILITY

PERSPECTIVES

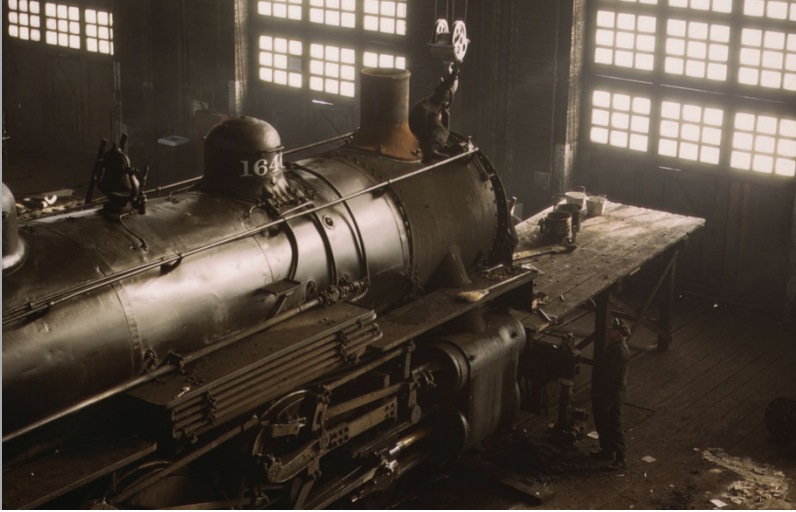
*Image courtesy of Sunshine Connelley*



# Share

This section discusses the final “R” of OER freedom: to “Redistribute.” Redistribution means sharing the original or derivative work. One important question to ask before deciding on a particular method of redistribution is whether you want to use an individual or third-party service.





# Self or third-party publishing?

Third-party services for OER are typically websites that will allow you to host your video, audio or text free of charge. Some websites carry advertising to support hosting costs. Others are supported by grant money and there are also websites supported by international agencies and non-profit foundations committed to the OER movement and consequently do not carry advertising.

One of the issues of self vs. third-party publishing has to do with control. Typically when placing an OER on a third-party website you sacrifice some control. For example, as part of their terms of service YouTube[1] can place whatever ads they'd like around a video. Others, like WikiEducator, allow for anyone with an account to edit a page, even if they are not directly affiliated with that project (although you can always rollback a page to a previous state). Another disadvantage of third-party services is that they can disappear, sometimes abruptly.

This disadvantage is less likely for well established services like Flickr, though the possibility always remains. The advantage of third-party services is that they are easy to use. Often all that is required is an e-mail account and the resources you want to share. Additionally, OER distributed through a third-party service tend to reach a wider audience.

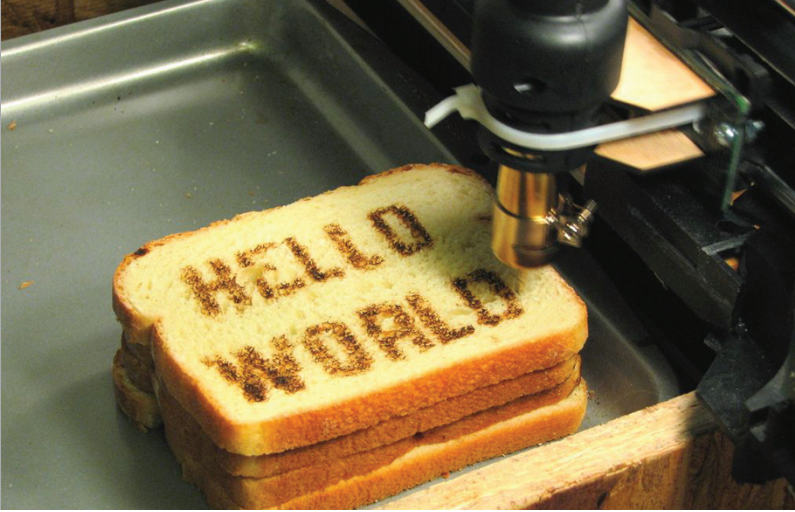
Self-publishing gives you complete control over the OER. However, self-publishing requires you to be entirely responsible for all aspects of the OER deployment. Hypothetically, assume you are a teacher who has collection of lessons that use OER exclusively and set up your own website.[2] Once the OER is on the website, you would make sure the website stays maintained and available. Google and other search engines will eventually find and index your website and display it in search results. However, your material may remain unknown for some time, depending on how much attention your project gains. While publishing an OER on your own can take time and sometimes money, for some the rewards of control outweigh any disadvantages.

Which method of distribution is right for you depends on what you value and how you see the OER being used. The decision also depends on your technical skills and abilities. Those with fewer technical skills, or who are newer to the OER community, or who have necessary skills but lack necessary time, may be more comfortable publishing with a third-party service.

## NOTES

1. <http://youtube.com/t/terms>
2. It is important to note that a resource does not become an OER until it is licensed with an open license. See the *License* chapter for more details.





# Self publishing

Self-publishing can be both rewarding and difficult. Difficult, because it requires a higher level of technical ability and rewarding because it offers complete control over your material. The first step is to decide where you want to publish. The following are a couple of things to consider when self-publishing online.

- ▶ The amount of space needed. How much you will need depends on the project itself. OER projects that are text-only require very little space, while OER with video can require significant space. Before looking at the publishing options, measure how much space the OER requires[1].
- ▶ The amount of bandwidth required. “Bandwidth” refers to the amount of data that can be transferred in a given time. Hosting services are usually very generous with bandwidth and you should not have trouble getting enough bandwidth. However, if the site receives a sudden spike in traffic, or a large amount of bandwidth, this may become an issue. Be sure to consider users with low bandwidth.

- ▶ The URL (Uniform Resource Locator). This will be the web address of your OER. For example, <http://www.myoer.net>.
- ▶ Support. Different hosting services have varying levels of support available.

## PUBLISHING ON YOUR OWN

There are several companies which could host your OER. Many of them are similar and do not offer significant benefit over another. The important attributes you want to look at are bandwidth, filespace and cost. Here are typical ranges for website hosting:

- ▶ Cost: between \$5-10 USD per month[2]
- ▶ Filespace: between 200-300 Gigabytes[3]
- ▶ Bandwidth: around 2,500 GB, or 2.5 Terabytes[4]

Prices and features will vary from company to company. Many hosting companies will also list features such as Ruby on Rails, Python, Joomla, and shopping cart functionality. These features are for advanced web programming and are not relevant for basic OER hosting. Although, you may consider using a shopping cart or something similar to gather donations, assuming your OER is an ongoing project. Be sure to ask what type of support they will provide before signing up with a particular service. It is unlikely that you will find any hosting company that will answer every question and help you through every step of the process, but you should find a company that at least has a 24/7 support hotline.

Hosting is usually paid for in one year increments by credit card. Some hosting companies will allow purchases for less than a year, but the per-month cost is greater. Therefore, you should purchase a plan with the longest duration that seems reasonable to you.

Even though you are posting independent of your institution, be careful about what information you post online. Some institutions, especially

K-12, are very sensitive to what their educators post online. Consider checking with the institution before posting, or post anonymously.

## CHOOSING A URL

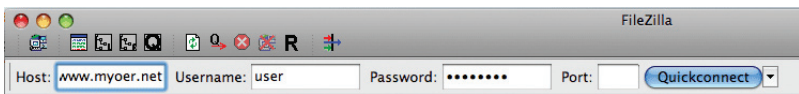
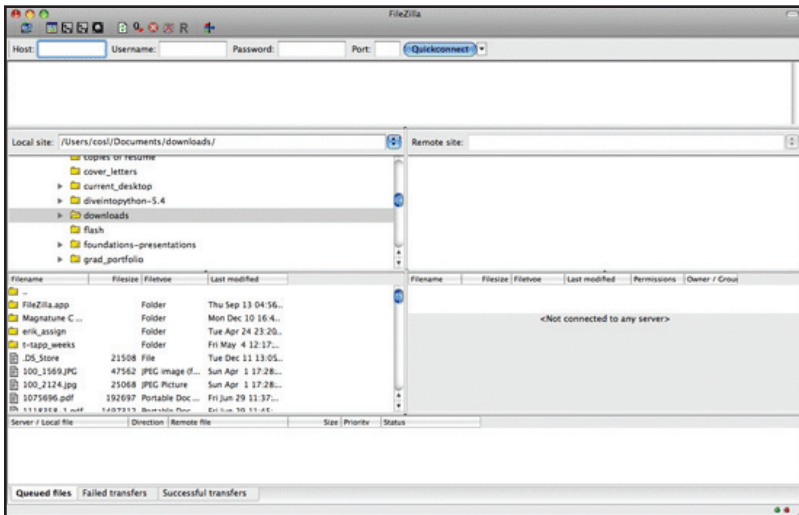
Once you have decided on a host, you will need to pick a URL (web address, like <http://www.wikieducator.org>). If you are hosting through your institution, most of the URL is likely picked out for you (e.g. <http://cc.usu.edu/~myusername>)[5]. The end of the URL will likely be the name of your OER folder followed by the name of the file.

When you go through a hosting company you have a lot more options. The best URLs are short and memorable. URLs should be descriptive of the OER. For ideas about what URL to use, do a Creative Commons search[6] and look for OER sites that are similar to yours. Your hosting company will walk you through the steps of actually obtaining a domain name (the first part of a URL).

## MOVING THE FILES

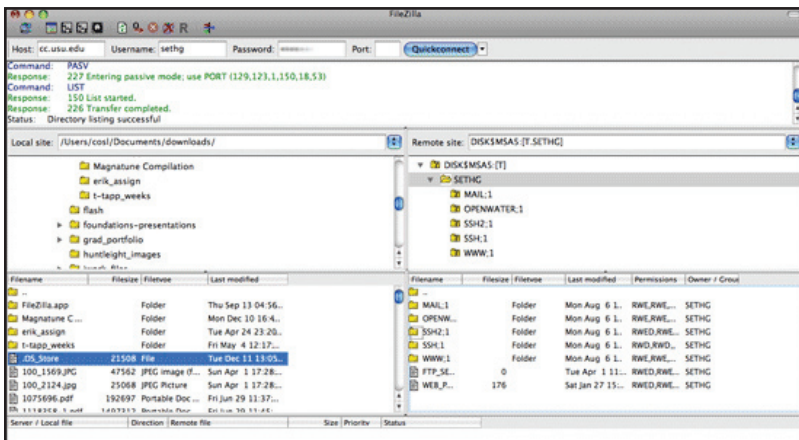
The next step is to transfer the files to your host. Generally files are moved by means of an FTP (File Transfer Protocol) program. (Some hosts require SCP or SFTP, which are more secure than, but conceptually the same as, FTP.) Some hosting companies have FTP programs built-in to their websites, so you will not need to download software. If you are going through your institution, you will probably need to use your own FTP program. There are several available for free, including the popular Filezilla[7] program (see Web Programs section in the Compose chapter for information about downloading Filezilla).

Every FTP program works slightly differently, so it's best to consult with your FTP program's documentation. The following is an example of how the FTP program Filezilla works.[8]



*Screenshot images in this section courtesy of Sgurell*

At the top of the Filezilla window you'll see "Host," "Username" and "Password" fields. The host is the URL of the website that will display your files. This should have been given to you by the web hosting company. If you are transferring files to your institution's website, consult with IT staff about the appropriate URL, username and password.



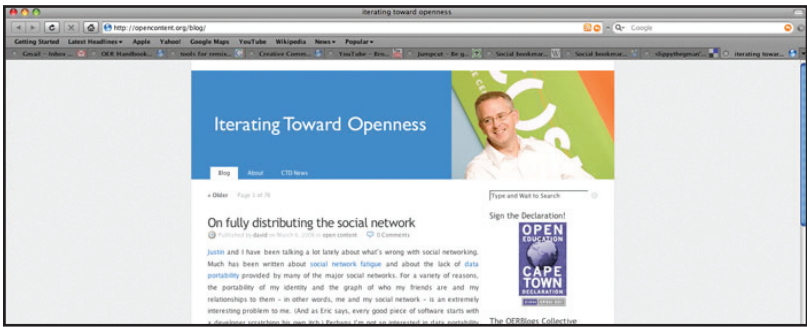
After you’ve logged in, note the window panes on the left and right. The window on the left shows the files on your computer (sometimes called the “local site”). The window on the right shows the files on the website (sometimes called the “remote site”). To transfer the files between the two, simply click and drag the files on the left to window on the right.

## SOCIAL BOOKMARKING

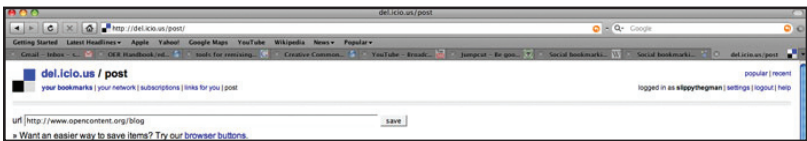
One option for creating a custom course is to use social bookmarking. Social bookmarking describes a type of website that allows you to organize and share web links with others. There are many social bookmarking sites active on the internet such as Del.icio.us[9], StumbleUpon[10], Digg[11], and Reddit[12]. Some sites are more popular than others, and each site works differently.

You’re probably familiar with regular bookmarking in your web browser. If not, bookmarking is a feature available on most web browsers in which you can save the web address for later use. Social bookmarking works in the same way, except the web address isn’t saved in your web browser.

Here’s how it works, using Del.icio.us as an example:



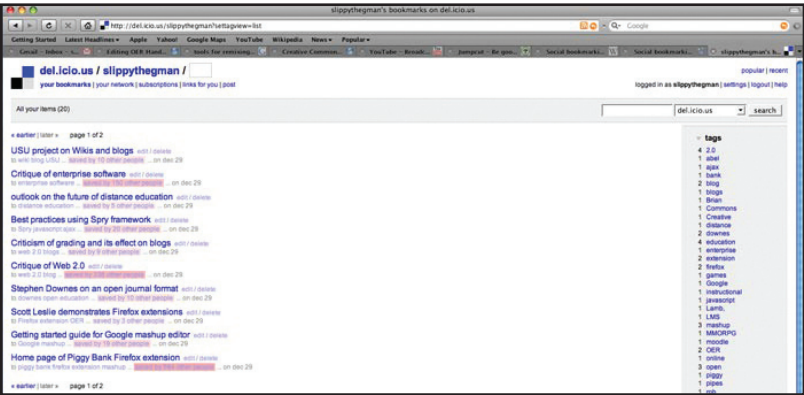
Find a website that you find interesting or useful.



Log in to your Del.icio.us account and add the URL.



Add “tags” to label the URL based on the content of the URL. Del.icio.us will provide suggestions for potential tags once you start typing.



Links can be organized into collections and viewed according to tag. The advantage of creating a custom course in this manner is that you could access it anywhere there is an internet connection and you can share the custom course with others. The other advantage is you can create a course for yourself without advanced technical knowledge. Using social bookmarking is also advantageous if you don't have the necessary skills to build and create web pages. The disadvantage is that everything in the course have a web address. Also, you are only allowed a small text box for adding notes about the link, so there isn't a lot of opportunity to add commentary or explanation. A third disadvantage is that you don't have control over the content at the links, so the information could potentially change or disappear at any time. Social bookmarking won't work for everyone with every course, but it is an easy option for some.

## SYNDICATE MATERIALS THROUGH RSS/ATOM



*Image courtesy of "Leigh Blackall" on Flickr*

As well as using complex, formalized packaging standards (like IMS), it is possible to share OER using simpler RSS[13] or Atom[14] feeds. Really Simple Syndication (RSS) feeds are used by many OpenCourseWare projects to publish basic information about their courses. Atom is an alternative format that provides similar functionality, and most applications that work with feeds support both. A “feed” is a list of items or in this case OER. This list can be accessed, processed, and understood by software programs automatically, providing you and your users a range of capabilities, like automatically telling you when new OER become available.

For example, members of the OpenCourseWare Consortium are encouraged to create RSS feeds with a minimum set of course information. Because computers can process them, RSS feeds are an important way to gather information and create specialized search engines. Some OER repositories automatically publish RSS feeds with a basic set of fields (for example, the eduCommons[15] software and OER Commons[16]). The Openlearn[17] project from the UK Open University has been pioneering the publication of its content using full course content RSS feeds, meaning that systems can automatically download



full courses for offline use as soon as they become available.

There are two notable examples of how OpenLearn content reuse has been facilitated through its publication via RSS:

1. *Openlearnigg* [18] - A customized version of a website called Corank[19] that imports Openlearn course unit details via RSS feeds, and then changes course unit URLs in order to publish all the OpenLearn content on the Openlearnigg site.
2. *Wordpress republication of OpenLearn content*. Jim Groom, an Instructional Technologist at the University of Mary Washington, has an example of a course about the artist Goya imported into Wordpress[20] (see Individual publishing section for more information about Wordpress). It works by importing OpenLearn content into Wordpress using an RSS feed that has entire course as part of the feed. The course is then published in the same format as a blog, but entirely customizable. Note that in order for Wordpress to accept the RSS you must have the Wp-o-Matic Wordpress[21] plugin (free, donation requested) installed.

For many educators manually creating and using RSS/Atom feeds is difficult, and simpler, automated methods of publishing RSS/Atom feeds should be used (some programs, like Wordpress[22] or eduCommons, automatically generate RSS feeds for you). See the Share chapter for more information.

## OTHER PROGRAMS FOR PUBLISHING

See *Learning Support Systems* section in *Compose* chapter for more information about each of these programs.

*eduCommons*[23]: specially designed for distributing OpenCourseWare. Free to download and use.

*Mediawiki*[24]: popular wiki software that used by many organizations, including Wikipedia.

*Moodle*[25]: Moodle does require some technical knowledge to install and create courses, but is not as complicated as starting an OCW.



Wordpress[26]: Wordpress is popular for creating blogs. Once installed, Wordpress has most, if not all, of the features needed to start a blog and you can add pictures, text and video to your site. David Wiley has posted an example of republishing OCW content using Wordpress.[27]

## NOTES

1. To check the size of a file or folder on Windows computers, right-click on the file and select properties. Select “properties.” A window will appear with the filesize. For Mac OS X users, ctrl-click on the file (the equivalent of a right-click). Select “Get Info.” A window will appear giving you the filesize. On GNU/GNU/Linux (e.g. Ubuntu), right click on the file and select “Properties” to view the file size.
2. Costs may vary significantly based on location and market forces
3. A gigabyte is about 1,000 megabytes
4. A terabyte is about 1,000 gigabytes
5. Though it is possible to arrange for a different domain to be redirected to a server in your institution.
6. <http://search.creativecommons.org>
7. <http://filezilla-project.org/>
8. The example uses the Mac OS X® version of Filezilla. Filezilla should work similarly on other operating systems.
9. <http://del.icio.us/>
10. <http://www.stumbleupon.com/>
11. <http://digg.com/>
12. <http://reddit.com/>
13. [http://en.wikipedia.org/wiki/RSS\\_\(file\\_format\)](http://en.wikipedia.org/wiki/RSS_(file_format))
14. [http://en.wikipedia.org/wiki/Atom\\_\(standard\)](http://en.wikipedia.org/wiki/Atom_(standard))
15. <http://cosl.usu.edu/projects/educommons/>
16. <http://oercommons.org/>
17. <http://www.openlearn.open.ac.uk>
18. <http://openlearnigg.corank.com>
19. <http://www.corank.com/>
20. <http://jimgroom.umwblogs.org/2008/02/17/proud-spammer-of-open-university-courses/>
21. <http://devthought.com/wp-o-matic-the-wordpress-rss-aggregator/>
22. <http://wordpress.org/>

23. <http://cosl.usu.edu/projects/educommons>
24. <http://www.mediawiki.org/wiki/MediaWiki>
25. <http://moodle.org/>
26. <http://wordpress.org/>
27. Announced here: <http://opencontent.org/blog/archives/464>    Published here: <http://newmediaocw.wordpress.com/>

*Image courtesy of “Leighblackall” on Flickr*

**THE READ/WRITE WEB AND A PERSONALISED MEDIA**  
everyone creates, the learning is in the creating, Papert’s constructionism,  
Siemens’ connectivism, Illich’s deschooling, Freire’s pedagogy of oppressed



# Third-party publishing

There are many different places to publish your OER. Each one has its own considerations and you should compare several sites to see which would best match your OER.

## PUBLISHING THROUGH YOUR INSTITUTION

If your institution offers personal webspace then that may be an optimal method for publishing. It is beneficial to publish through the institution for several reasons. One is that they generally have high bandwidth and serve up files quickly. Another benefit is that there is typically no additional cost to publish. Finally, IT staff can be supportive, although they are often have competing demands for their time. The downside to publishing through an institution is that you are restricted by their policies and you may limit your independence. These restrictions mean that you may have trouble getting permission to publish controversial material or that you have to rely on the institution to maintain your

content’s availability. You should check to see what policies your institution has in place regarding material published on its web site, and consider where you want your OER hosted in the long term.



*Image courtesy of Montrasio International*

Some institutions have a particular learning management system, or LMS (Blackboard, Desire2Learn, Moodle, etc.) that teachers are required to use in their teaching. With the exception of Moodle and a few others (see Course Management programs in the *Compose* chapter for a list), most courses in an LMS are password protected, preventing the material from being accessed openly by students outside the formal course. In some cases, Fair Use[1] (and the TEACH Act in the USA) allows you to make use of copyrighted materials you don’t have permission to use in online courses that are password protected, but as mentioned in the *Introduction*, “fair use” can be difficult to determine.

To be safe, you should abide by the license of any materials you use in your courses whether they are behind password protection or not. For example, you should not use material licensed with a Noncommercial clause for commercial purposes, even if the use is hidden within Blackboard or a similar LMS. It should be noted that “fair use” applies to OER, irrespective of the license.

The exact method of uploading material is highly specific to the LMS. If you have the OER combined as an IMS Content Package (see File Formats in the Find chapter) the process of uploading an entire course will be easier than manually adding each component through the LMS's upload interface. If the latter applies, talk with your institution's IT staff if you have not uploaded a course previously and need support.

One of the best things you can do to prepare for uploading OER is to have each file meaningfully named and the folders arranged in a logical manner. For example, if you have a fifteen week course, you might create a folder for each week and place the corresponding materials in each week's folder. Images would have file names such as "Hopi\_woman.jpg" or "red\_brick\_schoolhouse.png," as opposed to "imag1.tiff" or "Old\_picture.jpg."

## DOCUMENTS

*Scribd*: website for hosting documents. Scribd will accept common formats such as Open Document Format[2] (odt, odp, ods), Microsoft® Office formats (doc, docx, ppt, pptx, pps, xls, etc.), as well as PDFs. Anyone can display a Scribd document on their website and the original document can be downloaded. There is the option to use a Creative Commons license, though there does not appear to be any way to search specifically for Creative Commons licensed documents.

<http://www.scribd.com/>

*Slideshare*: website specifically for presentation slides. Slideshare is compatible with common presentation formats such as PPT (PowerPoint), ODP (Open Office) and PDF. Users can select a Creative Commons license, but as with Scribd, there is no way to search by Creative Commons license. <http://www.slideshare.net/>

## IMAGES

*Flickr*: visitors can sign up for a Flickr account for free and post a certain number of photos (premium accounts allow for more photos). As mentioned in the *Find* chapter, not all photos are licensed with a

Creative Commons license, but there are still a significant number that are (see the *Find* chapter for information about how to search for Creative Commons photos). Flickr is very helpful for OER, as it provides a highly visible way to both find and distribute OER.

*<http://www.flickr.com/>*

*Picasa Web Album:* Picasa has file importing and tracking features, as well as tags and collections for further sorting. It also offers several basic photo editing functions, including color enhancement, red eye reduction and cropping. Other features include slide shows, printing and image timelines. Images can also be prepared for external use, such as for e-mailing or printing, by reducing file size and setting up page layouts. There is also integration with online photo printing services.

*<http://picasa.google.com>*

## MULTIMEDIA

*The Internet Archive:* typically the Internet Archive resources are over thirty years old; however, they do accept new submissions from anyone. Despite the Internet Archive's wide selection and generous license terms, it is not as popular as other video websites like YouTube. See General Repositories in the Find chapter for more information. The Internet Archive is an excellent choice for OER publishing when you want the resources to be available for a long time.

*<http://www.archive.org/index.php>*

*OpenOCW:* OpenCourseWare site sponsored by COSL. Most OpenCourseWare is hosted by an institution, and only members of that institution contribute to that OpenCourseWare initiative. OpenOCW, however, allows anyone to submit a course regardless of their institutional affiliation. *<http://openocw.org/>*

*PBwiki:* visitors can set up a wiki with little technical knowledge. PBwikis can be set to private, so that only those with the password can access it, or made public. Free accounts have a limit on the number of pages you can create, but premium accounts are available at \$9.95 USD per month. *<http://pbwiki.com/>*

*WikiEducator*: wiki hosted by the Commonwealth of Learning (CoL). All content licensed CC-BY-SA. See *General Repositories* section in the *Find* chapter for more information.

*Wordpress*: Wordpress blogs can be hosted at [wordpress.com](http://wordpress.com) if you choose not to download their software and not use it on your own site. <http://wordpress.com/>

## VIDEO

*Blip.tv*: video sharing site that emphasizes ongoing productions. This site might be useful for a series of lectures or video series. Some footage may be inappropriate for younger audiences; use caution when exploring the website. *Blip.tv*

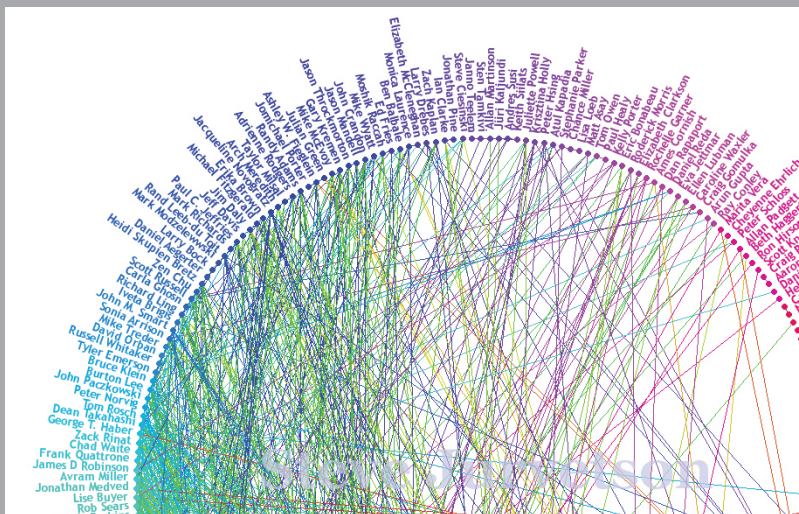
*Google Video*: video sharing site hosted by Google. Although Google owns both Google Video and YouTube, YouTube seems to have more visitors. The two sites are similar in features, although Google Video will give you recommended videos based on the websites you visit. As with other video sharing sites, you should be careful as students can find inappropriate videos on Google Video. <http://video.google.com/>

*Kaltura*: better localizing and remixing options than YouTube and TeacherTube, but not as popular. See *General Repositories* section in the *Find* chapter for more information. <http://www.kaltura.com/>

*TeacherTube*: very similar to YouTube, but specifically focused on educational materials. TeacherTube has the same restrictions on downloading as YouTube, and is not as widely known. TeacherTube is a good method of distributing a video if you are trying to reach other educators and wish to access it in settings with filtered internet connections (e.g. classroom). <http://www.teachertube.com/index.php>

*YouTube*: YouTube's interface is easy to use and it accepts many of the common video formats (see YouTube's help section for more information). YouTube is an excellent way to give an OER project high visibility, but does poorly in providing opportunities for localizing, remixing and redistribution. See *General Repositories* section in the *Find* chapter. <http://www.youtube.com/>





# Linking between versions

With the possibility of high-bandwidth, low bandwidth, mobile and offline versions of a resource, keeping track of everything can seem overwhelming. At this point, it is worth noting you are not required to develop every single version of your OER. You may find that you don't have the time or knowledge to create the different versions. In those cases it is more important that an OER gets released than it is that all possible versions get released.

Most self-published OER display the high-bandwidth version prominently, with the others available separately. If there are only a few different types of downloads, you may want to consider listing them to the side (e.g. a video playing with links to the left). If you are publishing a complex OER yourself, you could consider multiple domains. For example, the high-bandwidth version might be “www.myoer.net” and the mobile version would be “www.myoer.mobi.”

Some large repositories have rules, or at least preferences, regarding



how different versions should be displayed. Read the guidelines or contact them for more information before posting.

## LINKING BETWEEN PREVIOUS VERSIONS

To assist with localization and remix, it is recommended that you make high-quality versions in a lossless format available (see the format interoperability section for more information). There is no universal way to designate different versions of an OER. Some chose a number-decimal system (e.g. 1.2, 1.3.). Others simply choose to date each version (e.g. myOER 12 Jun 2008). As with version tracking for different bandwidth types, major repositories have their own system and you should consult with them before submission.

## DECIDING WHICH VERSIONS TO MAKE AVAILABLE

When creating an OER, it is not uncommon to go through several different versions before publishing. Some of these major revisions are important to the OER because they represent a crucial project decision. Depending on the OER, some of these versions may be worth posting online. However, you do not want to discourage visitors and future localization and remixing, you will want to limit the number of versions you can make available.

Think of your OER and the major steps of development. Ask yourself whether it would be helpful to have the OER available at each of these major steps. The answer to that question may depend on how much effort an individual change might take. For example, say you created an instructional video about cells and added a new section about mitochondria. The video may or may not be radically different with the addition of this new section and it may be appropriate to make both versions available. On the other hand, other educators may be able to edit the mitochondria section out as well as any other section by using a video editor. So whether or not you make a previous version available depends on how much educational value you see in it and how that version will assist future localization and remixing. As a general rule, if you have over three previous versions of a resource published, there are too many available.

*Image courtesy of “Steve & Jemma Copley” on Flickr*



# Publishing students work

For K-12 learners, student work should be published only very carefully. One of the greatest concerns when publishing a student's work is to maintain privacy. Stories of online predators make front-page headlines, but are not necessarily reflective of reality. For example, Wolak et al. (2008) from the University of New Hampshire reported that “only 5% of predators pretended to be teens when they met potential victims online” (p. 112). Neither this report, nor others like it, are meant to diminish the seriousness of internet predators, or suggest educators should be casual about posting student material online. But these issues should be looked at realistically, without undue paranoia.

Some OER projects, such as a mashup of video relating to an election, have minimal privacy concerns when published on something like YouTube. In cases such as these, the students would not necessarily expose themselves to any privacy problems. It should be noted that even OER without video or pictures of learners may still have privacy problems if the attribution is too revealing. Use your best judgment

and rely on applicable local policy and law when deciding what type of attribution to give.

OER that include images or video of students can be problematic. Recently, the parents of a minor began a lawsuit against Creative Commons, a photographer and Virgin Australia for using a picture of their daughter (which had a Creative Commons license) as part of an advertisement. At the time of this writing, the case has not been resolved, but it does demonstrate some of the complications of using students' images (Lessig, 2007; Linksvayer, 2007). A simple way to work around this is to obtain parental permission before publishing. In the parental permission slip you'll want to explain the nature of what you're publishing and where it can be found. In the U.S., learners below the age of 18 are not able to make contracts, and therefore cannot license their material openly. Check with your institution's legal department for local laws and institution-specific policies regarding learner privacy.

Privacy is not as large of an issue in higher education settings. Learners are often of age and do not require parental permission slips. However, learners should be informed about what, where and when the content will be published and how they will be attributed. It is critical to remember that these students are the copyright holders of the work they produce. Also, check with your institution's legal department regarding policy.

## SOURCES

Lessig, L. (2007, September 22). On the Texas suit against Virgin and Creative Commons. Retrieved March 21, 2008, from [http://lessig.org/blog/2007/09/on\\_the\\_texas\\_suit\\_against\\_virg.html](http://lessig.org/blog/2007/09/on_the_texas_suit_against_virg.html)

Linksvayer, M. (2007, September 27). Lawsuit Against Virgin Mobile and Creative Commons – FAQ. Retrieved March 21, 2008, <http://creativecommons.org/weblog/entry/7680>

Wolak et al. (February-March 2008). Online “Predators” and Their Victims: Myths, Realities, and implications for Prevention and Treatment. *American Psychologist*. 63(2), 111-128. Retrieved March 21, 2008, from <http://www.apa.org/journals/releases/amp632111.pdf>

*Image courtesy of “Malkav” on Flickr*



# Accessibility

Publishing in an accessible manner should be easy, if you have paid attention to accessibility in the other parts of the OER life cycle. However, there are a few final accessibility considerations when publishing OER.

## SELF-PUBLISHING

Though an OER may meet accessible standards, the website it is published through should also be accessible. There are several things that can be done in the underlying HTML code to make it more accessible to screenreaders and other accessibility devices (see [Use Accessibility](#) for more information). To check whether or not a web page is accessible, use the [Wave Web Accessibility Evaluation Tool](#)[1]. However, even if a web page is tested through an accessibility validator, there may still be parts of the website that are inaccessible. The only way to know whether a website is accessible is to test it with feedback from a person with disabilities. When self-publishing, you should provide some method of contact, whether it is an e-mail or physical address. By including contact information, learners can provide feedback about accessibility issues and other aspects of the OER.

## ADA AND SECTION 508

U.S. law stipulates through the Americans with Disabilities Act (ADA) that persons with disabilities must be accommodated in public spaces. There has been some disagreement about just how much accommodation a website must provide (Brodkin, 2007). But regardless of how particular lawsuits are settled, it is clear that there is at least some expectation of accommodation for persons with disabilities. And in the open education movement, where the primary goal is to increase access to learning opportunities, these expectations are even higher. See *Accessibility* in the *Adapt* chapter for steps that can be taken to make your OER more accessible.

Section 508 is a part of U.S. law that stipulates federal agencies provide equal access to electronic information. If you are an employee of a federal agency you are required to make educational materials accessible to persons with disabilities (United States Access Board, n.d.).

## THIRD-PARTY PUBLISHING

Many large repositories have accessibility features. Some features are built in to the software used, such as MediaWiki and Plone (See *Learning Support Systems* in the *Compose* chapter), and others are developed on top of the software. The level of accessibility differs between repositories, but most are at least readable by screenreaders. Some might require, or at least allow, closed captioning or alternate versions of the OER that are more accessible. You should contact a repository before submission to find out what accessibility features are available. They may also have suggestions on how to your OER more accessible.

Some repositories that would be useful for improved accessibility:

- ▶ DotSUB: collaborative video closed captioning.
- ▶ LibriVox: free audiobooks; useful for those with visual impairments. (See *Humanities Repositories* in *Find OER* for more information).

## NOTES

1. <http://wave.webaim.org/>

## SOURCES

Brodkin, J. (2007, January 5). Blind Americans demand web access; Target fights back. Network World. Retrieved June 18, 2008 from <http://www.networkworld.com/news/2007/010508-target.html?page=1>

United States Access Board. (n.d.). Section 508 Homepage: Electronic and Information Technology. Retrieved June 18, 2008, from <http://www.access-board.gov/508.htm>



# Perspectives

I am unconvinced in the need for repositories and referatories. As long as an OER has been produced using a suitable file format, and has a machine-readable license deed applied to it, tools such as the Creative Commons Search utility should suffice. Individuals and organizations would be free to publish their content in any location visible to the open Web, and allow the existing infrastructure of Google, Yahoo, and the like to spider and index their resources for all to find and use. There is no need for creating walled gardens or silos of open educational content in the form of repositories or referatories (Norman, 2007).

Finally, in the context of project goals, an open educational resource project must make decisions about which of the many available funding models is most likely to result in levels of funding sufficient to allow the project to continue meeting its goals in an ongoing manner (Wiley, 2007).

Teaching and publishing should be more closely connected, to avoid a de-contextualisation of the materials and to lower the threshold for publication (Pfeffer, 2008).



A college student helping a second-grade elementary school student with a project on hand-eye coordination. See Opening Our Minds[1] for videos of this project.

In seeking a mechanism for collaborative student work for a new college course for primary educators, I quickly realized that a wiki format was ideal. With little time remaining, I initially selected the Education Wiki hosted by Wikia because of their responsiveness to my questions and my basic familiarity with the editing platform. I had a successful semester working on Wikia. I found the site administrators congenial, helpful, and generous in teaching me the basics and some other very useful skills.

Because the community on the Education Wiki was small I began searching for a larger group with greater potential for collaboration. Wikieducator administrators were even more responsive and helpful and seemed genuinely excited about what I was attempting to accomplish. I set up an initial page, but lacked time to handle the daunting task of moving all of my content pages and their associated images. However, the previously-innocuous advertising at the Wikia site became occasionally offensive to the point that I was no longer comfortable sending teachers there. The advertising was the final motivation to move, and so, with student help, I moved everything over to Wikieducator's Biology in elementary schools[2] course.

Beginning in January 2008, 36 students from my course have established user names and developed their teaching ideas to share on Wikieducator. This newer student cohort had the advantage of working with an instructor with a year of wiki experience under his belt, and the learning curve was, I hope, less steep. This latest student group reflected on their experiences with wiki educator here: Wiki reflections.

WikiEducator has proven an ideal host. It offers all of the advantages of my previous site, lacks the advertising, and has additional features like the PDF generator, and collaborative video editing. After a second semester with a larger student group, I have ironed out several kinks, and look forward to learning more in future semesters (McCabe, 2008).



## NOTES

1. [http://wikieducator.org/Opening\\_Our\\_Minds](http://wikieducator.org/Opening_Our_Minds)
2. [http://www.wikieducator.org/Biology\\_in\\_elementary\\_schools](http://www.wikieducator.org/Biology_in_elementary_schools)

## SOURCES

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McCabe, D.J. (2008, May 21).

Pfeffer, T. (Last Updated 2008, March 27). OER stories: Klagenfurt OpenCourseWare. OER Wiki. Retrieved May 14, 2008, [http://oerwiki.iiep-unesco.org/index.php?title=OER\\_stories:\\_Klagenfurt\\_OpenCourseWare](http://oerwiki.iiep-unesco.org/index.php?title=OER_stories:_Klagenfurt_OpenCourseWare)

Wiley, D. (2007). On the sustainability of open educational resource initiatives in higher education. Paper commissioned by the OECD's Centre for Educational Research and Innovation (CERI) for the project on Open Educational Resources. Retrieved May 13, 2008, from <http://www.oecd.org/dataoecd/33/9/38645447.pdf>



*Image courtesy of "Franz Patzig" on Flickr*



# License

the ability to share resources

In this chapter

COPYRIGHT CLEARANCE

LICENSE COMPATIBILITY

CREATIVE COMMONS

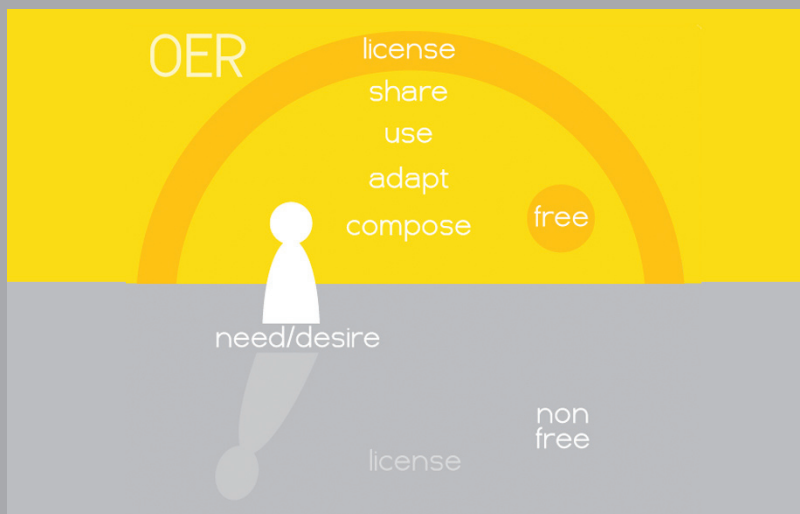
ADDING A CREATIVE COMMONS LICENSE

GFDL

WHICH LICENSE SHOULD I CHOOSE?

PERSPECTIVES

Image courtesy of Sunshine Connelley



# License

Many educators assume that when they put content on the Internet, they are doing so to share with others. While that may be true, unless materials are licensed under open licenses (such as those described in this section), educators' freedom to share these resources is legally is restricted. Fair use applies, but as discussed earlier, sometimes that isn't enough. Perhaps the greatest gain to the OER movement would be if the huge number of educational resources already on the Internet were open licensed. Most educators are very willing to share. If all of the teacher-created web pages, lesson plans, handouts, and multimedia presentations already on the Internet were open licensed, the world of OER would increase by several-fold. To do this, all you need to do is add an open license to your work. You can use the "License Your Work" tool[1] provided on the Creative Commons site, which will also ensure that your work gets listed in OER search engines. For print material, you should display the license along with a link to the legal code (ex: <http://creativecommons.org/licenses/by/3.0/us/> [2]).

The legal aspects of an OER project can be daunting. Excellent resources exist online, and there are people willing to help with your questions, but the best solution is a local expert who you can rely on. If your institution has a legal department, ask for a consultation.

Copyright law varies from country to country, but it generally provides legal protection - over a limited period of time - for original works. It does not matter if these works are published or not, both are protected.

Copyright reserves certain rights for the copyright holder, while others need to ask permission to do any of the following:

- ▶ Create derivative works from the original work
- ▶ Distribute originals or copies of the work
- ▶ Publicly display or perform the work.

In the US, once the copyright period is over, these limitations fall away (Cornell's Copyright Information Center[3] has more information).

After the limitations have expired, the work is said to be 'in the public domain.' A work in the public domain can be used without the author's permission as well as modified to suit whatever purpose you would like.

Additionally, certain exemptions to copyright protection are set out in laws or regulation, referred to as "fair use" or "fair dealing" in some countries. What constitutes fair use varies from country to country.

As mentioned in the introduction, legal issues prevent the wide-spread sharing of educational resources without the use of an 'open' license. This section will describe some of the most popular open licenses including Creative Commons and the GNU Free Documentation License (GFDL).

## NOTES

1. <http://creativecommons.org/license/>
2. See *Adding a Creative Commons License* for more information.
3. [http://www.copyright.cornell.edu/public\\_domain/](http://www.copyright.cornell.edu/public_domain/)

## SOURCES

Schmidt, P. (2007, November). "6.3 Licensing Guidelines." UNESCO OER toolkit. WikiEducator. Retrieved March 21, 2008, from [http://www.wikieducator.org/UNESCO\\_OER\\_Toolkit\\_Draft#Licensing\\_guidelines](http://www.wikieducator.org/UNESCO_OER_Toolkit_Draft#Licensing_guidelines)

*Image courtesy of “rita banerji” on Flickr*



# Copyright Clearance

Before licensing your OER, you will need to obtain copyright clearance for any copyrighted materials you intend on using. Some potential resources may be under copyright. Possible copyrighted material might include: parts of textbooks, images out of major magazines, etc. While using these resources in the classroom, you were likely covered by “fair use” laws[1]. Unfortunately, in order for these materials to be available as OER, copyright clearance must be obtained. Copyright clearance means that you have permission, ideally written, from the copyright holder to use the resource as an OER. For commercially published resources, such as textbooks or magazines, it is unlikely that you’ll be able to obtain copyright clearance, because of the publishers’ desire to be exclusive copyright holders and receive income generated from royalties. Therefore, you would need to replace the material with something licensed openly[2].

When requesting copyright clearance, you need to be specific about which materials and how they will be used. You should also indicate

that you are contacting them because you believe they are the copyright holder.

The following is a sample copyright clearance letter for an OCW course[3].

If this is a physical letter, include the date and physical return address.

*Dear \_\_\_\_\_:*

*I am in the process of creating an online course: English 1010: Beginning Writing. The course is intended to be a part of Utah State University's OpenCourseWare. These OpenCourseWare courses are freely available to everyone, regardless of enrollment status with the university. I would like to include material found at the following URL(s):*

*(List of applicable URLs)*

*Additionally, I would like permission to adapt, modify, and build upon material at the URLs listed above for use in an online intermediate writing course. I am flexible about any restrictions regarding modification, so feel free to discuss any concerns you might have.*

*Please advise how you would like to be acknowledged.*

*If the copyright is held by another party, I would appreciate any contact information you have regarding the proper rights holder(s). Otherwise, by consenting to our request you are confirming that you have the right to grant permission.*

*I would greatly appreciate your permission to use these materials and emphasize they will be used for a non-commercial purpose. For more information about USU's OpenCourseWare, visit <http://ocw.usu.edu>. If you have any questions for myself, feel free to contact me at*

*\_\_\_\_\_*

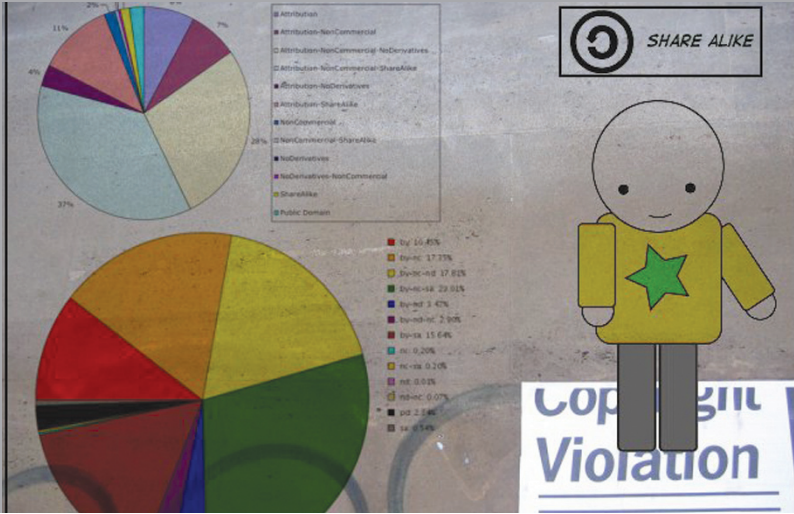
*Sincerely,  
(name)*

After sending out the copyright clearance letters, be prepared to wait. Organizations that are copyright holders will sometimes take a long time to respond to copyright clearance requests. Individuals, with the exception of very prominent ones, will usually respond within a few days (sometimes it can be as short as few minutes by e-mail). Some copyright holders will, unfortunately, not respond. In those situations, it is best to find alternate resources. Do not take a lack of response as copyright clearance.

## NOTES

1. See *Why OER?* in the *Introduction* for more information.
2. See the *Find* chapter for more details.
3. The letter may be adapted to individual circumstances as needs dictate. However, it is a sample letter and not necessarily legally binding.





# License Compatibility

It seems only natural to assume that an OER with a Creative Commons license could be mixed with an OER with a different license.

Unfortunately, this is not the case. Some licenses are incompatible with others. Probably the most prominent example is Wikipedia, which uses the GNU Free Documentation License, not being compatible with, for example, WikiEducator, which uses Creative Commons Attribution-ShareAlike. Although the licenses are similar in intent, they are not compatible; meaning you cannot take Wikipedia material and mix it with material from WikiEducator or other sources (e.g. blogs) that are licensed with a Creative Commons license. This is because of the requirement that derivative works are released under exactly the same license as the source materials. However, it is possible to release a derivative work under a dual license, particularly where the sub-sections can be identified as discrete parts. In other words, parts of the material could be licensed with Creative Commons and part GFDL, provided the different sections are clearly defined and marked.

Because of the many different types of licenses available, and all the possible combinations, it is difficult to explain every possible license incompatibility. However, the following is a compatibility chart for license within the Creative Commons suite (boxes without a “smiley” face indicate incompatibility) (Wiley, 2007; Creative Commons, n.d.).

Creative Commons Licenses Compatibility Wizard										
<div>Reset</div> <div>All Licenses of Used Works ↓↓↓ (Multi-selection) ↓↓↓</div>	Compatible Licenses:	BY	BY	BY	BY	BY	BY	BY	PD	
BY		☺	☺	☺	☺	☺	☺	☺		☺
BY			☺	☺	☺			☺		
BY				☺						
BY					☺					
BY				☺		☺				
BY							☺			
								☺		
PD		☺	☺	☺	☺	☺	☺	☺	☺	☺
									☺	
								☺		☺

Image by David Wiley made using <http://creativecommons.org.tw/licwiz/english.html>

### IF I LICENSE INCORRECTLY AM I GOING TO BE SUED?

The short answer is: *possibly*.

The long answer is: You should do your best to understand the terms of the license under which you use an OER. The most common ways you might violate the terms of a license are:

- ▶ Making commercial or for-profit use of an OER whose license includes the noncommercial (NC) clause
- ▶ Making derivative works from an OER whose license includes the No Derivatives (ND) clause
- ▶ Failing to share derivatives of an OER whose license includes the Share Alike (SA) clause

If you do your best to understand the license and are acting in good faith, it is unlikely that you will face immediate legal action for violating the terms of an OER license. Common practice in the open education community is for a rights holder to notify a violator that their actions are inappropriate and request that they make necessary changes. If you receive this sort of notice and refuse to comply, you greatly increase your chances of being sued.[1]

## THIS LICENSE THING SEEMS REALLY COMPLICATED, IS THIS ALL REALLY NECESSARY?

As people learn more about OER, the idea of license incompatibility can scare them. You should keep in mind that traditional copyright is not straightforward either (see Cornell's copyright table[2] as an example).

For some, licensing represents an important part of who they are in the OER community as well as their philosophy about OER. Arguably, the OER community has spent too much time arguing about licenses. While having so many licenses may seem redundant and wasteful, it is actually a reflection of the freedoms of OER. In other words, everyone sees OER a little differently and that is why there are so many licenses. The good news is that the organizations behind these licenses are starting to keep license incompatibility in mind as they develop future versions of their licenses. For example, both Creative Commons, Wikimedia Foundation, and the Free Software Foundation are working to make Creative Commons licenses compatible with the GFDL (Wikimedia Foundation Inc., 2007).

## WHAT SHOULD I DO?

Pay attention to the licenses of the material you are using and obey by the terms of those licenses, especially noncommercial, No Derivatives, and Share Alike. As you're combining material, ask yourself: Is there anything that this license requires that doesn't work with the requirements of my other material? If the answer is "yes," then it is best to not to use that material. One option is to contact the copyright holder and ask whether or not the use is incompatible. The copyright holder may or may not be sure either, but the copyright holder is the most important person to talk to in that type of situation. Another option is to contact others in the OER community to answer your questions.[3]

If you cannot contact the copyright holder, and are still uncertain about the use, use your best judgment. Depending on your level of concern about liability, you may want to consider foregoing the mixing of the two resources entirely.

The purpose of this section is not to scare you away from creating OER, but to make you aware of an area of concern when creating OER. In some ways, OER incompatibility is more a matter of theory than it is a problem in practice. Nevertheless, you should always abide by the license clauses of material that you use.

## NOTES

1. This information should not be construed as legal advice; for legal advice you should seek the counsel of an appropriately licensed individual or firm.
2. [http://www.copyright.cornell.edu/public\\_domain/](http://www.copyright.cornell.edu/public_domain/)
3. See OER Forums in the Conclusion

## SOURCES

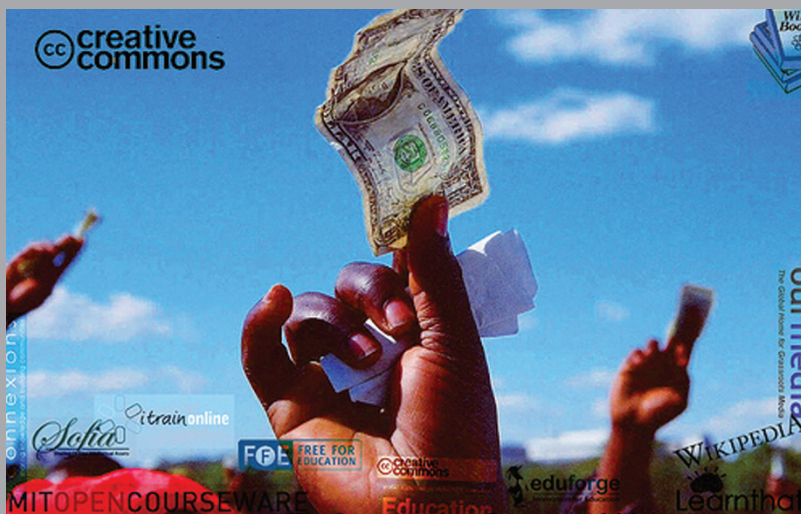
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Wikimedia Foundation, Inc. (2007, December 1). Resolution:License update. Retrieved March 25, 2008, from [http://wikimediafoundation.org/wiki/Resolution:License\\_update](http://wikimediafoundation.org/wiki/Resolution:License_update)

Image courtesy of “Leighblackall and Elvert Barnes and EXB-WDC” on Flickr



# Creative Commons

Creative Commons started as a way to reserve some rights over an intellectual work without making it absolutely free, as is the case when something is put in the public domain. There is no single Creative Commons license. Rather, there are several different Creative Commons licenses, which allow for different freedoms. The idea behind Creative Commons is to give licensors a simple way of understanding copyright, without complicated legal jargon. Regardless of which Creative Commons license you choose, it should always clearly indicate somewhere in the resource that the material is licensed with a Creative Commons license.

Though the Creative Commons licenses are meant to be easy to understand, it is still important to know a few key terms. Here's a sample Creative Commons license.

The “BY” clause of the license indicates “Attribution” (BY whom the work was authored). That means whenever this resource is used the author needs to be given credit. Creative Commons does not specify how the attribution must be given, except that it should follow any stipulations given by the author. For example, an author might specify that attribution must read “John Doe - Wikia Inc. <http://www.wikia.com>.” In that case

you should follow the author's wishes. If the author does not specify, it is up to you to determine how to attribute the work. As an example, say you have an image that you used in an instructional video. You are not obligated to give attribution at the exact moment in the video you use the image, but you would want to list the author and the URL of the image in the credits at the end. However, you are ethically obligated to display the attribution in a clear and meaningful manner. Putting the attribution in a tiny font size, or providing only the name without any indication of where the resource came from, would be examples of unethical or inappropriate attribution.

The "NC" clause stands for "Noncommercial." The Noncommercial clause specifies that a work cannot be used for commercial purposes. The Noncommercial clause is the most controversial of the Creative Commons license clauses because Creative Commons provides no authoritative definition of "commercial."

"SA" stands for "Share Alike." The "SA" clause specifies that however the resource is used, revised, or remixed, the result must be shared in the same way. For example, say you were creating a video that used a song that was licensed with a "Share Alike" clause. That video must then be licensed with the same license as the song. Some believe that the SA clause is helpful in assuring that OER stay freely available to the community (Francom, 2007). Others feel that the SA clause is an impediment to legitimate users of OER that for one reason or another are not able to license the new work as Share Alike (Wiley, "Sharealike").

"ND" stands for "No Derivatives." Derivatives are variations from the original. Examples of derivatives might include: rewriting text, cropping an image or reducing the length of the video. Putting a "No Derivatives" clause on the license also prevents translation. The No Derivatives clause is often used when the exact presentation of a resource is very important (Creative Commons, "FAQ").

Here are some examples of license possibilities:

## **ATTRIBUTION (BY)**

This license lets others distribute, remix, tweak, and build upon your work, even commercially, as long as they credit you for the original.

This is the most accommodating of licenses offered, in terms of what others can do with your works licensed under Attribution.

### ATTRIBUTION SHARE ALIKE (BY-SA)

This license lets others remix, tweak, and build upon your work even for commercial reasons, as long as they credit you and license their derivatives under the identical terms. This license is often compared to copyleft[1] free software[2] licenses. All new works based on yours will carry the same license, so any derivatives will also allow modification and commercial use.

### ATTRIBUTION NO DERIVATIVES (BY-ND)

This license allows for redistribution, commercial and noncommercial, as long as it is passed along unchanged and in whole, with credit to you.

### ATTRIBUTION NONCOMMERCIAL (BY-NC)

This license lets others remix, tweak, and build upon your work non-commercially, and although their new works must also acknowledge you and be non-commercial, they don't have to license their derivative works on the same terms.

### ATTRIBUTION NON-COMMERCIAL SHARE ALIKE (BY-NC-SA)

This license lets others remix, tweak, and build upon your work non-commercially, as long as they credit you and license their derivatives under the identical terms. Others can download and redistribute your work just like the by-nc-nd license, but they can also translate, make remixes, and produce new stories based on your work. All new work based on yours will carry the same license, so any derivatives will also be non-commercial in nature.

### ATTRIBUTION NON-COMMERCIAL NO DERIVATIVES (BY-NC-ND)

As discussed above, this license is the most restrictive of the six main licenses allowing redistribution. This license is often called the “free advertising” license because it allows others to download your works



and share them with others as long as they mention you and link back to you, but they can't change them in any way or use them commercially (*Creative Commons*, "License").

## OTHER CREATIVE COMMONS LICENSES

Beyond the different combinations of Creative Commons clauses, there are two other licenses in development: CC0 and CC+. CC+ is a way of granting extra rights in some situations without having to grant two separate licenses. CC0 is meant to overcome legal difficulties when trying to commit something to the public domain. Some of these difficulties include confirming the dedication of each object (imagine a large repository) and differences in the way some jurisdictions allow works to pass into the public domain. To provide the benefits of a public domain while remaining legally viable, the CC0 license grants the freedom of public domain in a legally viable manner. Both of these licenses are still being tested and improved, so you should not use them for important resources until they have been finalized (Steuer, 2007).

## SOURCE

Creative Commons. (n.d.). License Your Work. Retrieved March 21, 2008, from <http://creativecommons.org/about/license/>

Creative Commons. (n.d.). FAQ - ccLearn. Retrieved April 2, 2008, from <http://learn.creativecommons.org/resources/faq>

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Steuer, E. (2007, December 17). Creative Commons Launches CC+ and CC0 Programs. Retrieved April 11, 2008, from <http://creativecommons.org/press-releases/entry/7919>

Wiley, D. (2007, July 19). ShareAlike, the Public Domain, and Privileging. Iterating Towards Openness. Retrieved June 3, 2008, from <http://opencontent.org/blog/archives/348>

Image courtesy of “orphanjones” on Flickr



# Adding a Creative Commons License

Some services, such as Flickr or an OpenCourseWare site, have their own custom method for selecting a license. Other services use the same license for all of the resources hosted on their website. However, if you need to license a resource on an individual website it is a fairly straightforward process. Linking to the legal code of the license is a necessary part of licensing your OER. It is also helpful because some search engines (Google, Yahoo) will identify it specifically as an OER.

First, go to the license generator page (*see page opposite*) on the Creative Commons website[1] (note that the CC0[2] license has a different URL and CC+ does not have a license selection page). You'll then see a list of questions for you to answer. The first question asks whether you want to allow commercial use. The second question asks whether you want to allow derivatives. Choose which license you think would be most appropriate. Next, you'll be asked to select the country of jurisdiction (which is the country you are located in).

## choose license

With a Creative Commons license, **you keep your copyright** but allow people to [copy and distribute your work](#) provided they [give you credit](#) — and only on the conditions you specify here. For those new to Creative Commons licensing, we've prepared [a list of things to think about](#). If you want to offer your work with no conditions, choose the public domain.

**Allow commercial uses of your work?**

☒ Yes ⓘ

☐ No ⓘ

**Allow modifications of your work?**

☒ Yes ⓘ

☐ Yes, as long as others share alike ⓘ

☐ No ⓘ

Jurisdiction of your license ⓘ

United States ⓘ

**Additional Information**

The additional fields are **optional**, but will be embedded in the HTML generated for your license. This allows users of your work to determine how to attribute it or where to go for more information about the work. ⓘ

**Tell us the format of your work:** Other ⓘ

**Title of work** ⓘ

**Attribute work to name** ⓘ

**Attribute work to URL** ⓘ

**Source work URL** ⓘ

**More permissions URL** ⓘ

Select a License

Image courtesy of Sgurell

The box marked “Additional Information” allows you to provide further metadata so OER search engines can better identify your work. They are optional and not necessary for actual licensing, but are helpful to others. The first field is for the type of work you are licensing (e.g. video, audio, text, etc.). The subsequent fields are to assist in attribution. Here is what each of the fields mean:

- ▶ Title of work: The name of the OER. This field is particularly helpful for images in which the title is not immediately clear.
- ▶ Attribute work to name: Name of the person(s) or organization who developed the OER.
- ▶ Attribute work to URL: Web address of the OER.
- ▶ Source work URL: web address(es) of content that was used as part of the OER.
- ▶ More permissions URL: Web address where a user can find out more about the freedoms and restrictions associated with the work. For example, some repositories have their own definition of what constitutes Noncommercial use.

Once you have finished filling out the fields, click “Select a License,” and you’ll be taken to a new page (*see page opposite*).

On this new page, you’ll have three options for license images. Each of the images lead to same license, so it is purely a matter of aesthetic taste. The text below is the HTML code necessary to get the license image displayed on a page. If you do not know HTML, consult an education technologist or someone who is knowledgeable in web programming and design.

Once the image is on your website, visitors will be able to click on it and see the terms of the license under which you are sharing your OER.

## NOTES

1. ↑ <http://creativecommons.org/license>
2. ↑ <http://labs.creativecommons.org/license/zero>

# License Your Work

## Here is the license you've chosen

You have selected the Creative Commons Attribution-Share Alike 3.0 United States License. [See how the license will look](#) to your site's visitors.



## What to do next

### Have your own website?

Copy the text below to your Web site to let your visitors know what license applies to your works.

```
<a rel="license" href="http://creativecommons.org/licenses/by-sa/3.0/us/"></a><br/>This work is licensed under a <a rel="license" href="http://creativecommons.org/licenses/by-sa/3.0/us/">Creative Commons Attribution-Share Alike 3.0 United States License</a>.
```

*Image courtesy of Sgurell*



# GFDL

“GFDL” stands for GNU Free Documentation License (GNU is an acronym for GNU’s Not Unix and is related to software (GNU Project, “Overview”) ). It was created by the Free Software Foundation[1] (FSF) as a way of licensing manuals in a manner that is similar to the GPL software license (GNU Project, “GNU free documentation”). All of these acronyms are likely very confusing. Here are the important things to know about the GFDL:

- ▶ It is a copyleft (Share Alike) license used primarily for text and images.
- ▶ The largest user of the GFDL is Wikipedia.
- ▶ It requires a copy of the entire license to be attached to the resource licensed. This includes printouts and even applies when you use only a single image or paragraph.
- ▶ Currently it is not compatible with Creative Commons licensing. In December 2007 Wikipedia announced its intention to become compatible with Creative Commons licensing (Various, “Resolution”). However, this transition will take some time.

- ▶ You should use the GFDL if compatibility with Wikipedia is important; otherwise, a Creative Commons license may be preferable. This recommendation may change as the Free Software Foundation updates and revises the license.

Should you decide to use the GFDL, you should include the following HTML code in the web page (consult an instructional designer or someone familiar with web programming if you are not familiar with HTML):

```
<table><tr><td valign="center"></a></  
td><td valign="center"><b>GFDLcontent</b>  
<small>The work on this page is licensed under the  
<a href="http://en.wikipedia.org/wiki/GNU_Free_  
Documentation_License">GNU Free Documentation  
License</a>. The author states that the text and  
images can be used within the restrictions of this  
license (for example, they can be incorporated into  
certain free encyclopedias such as <a href="http://  
www.wikipedia.org">Wikipedia</a>). Please add a  
footer like this to your own webpages to promote free  
access to knowledge (<a href="http://en.wikipedia.  
org/wiki/Wikipedia:Adding_a_GFDL_license_to_your_  
webpage">see Wikipedia's instructions</a>).</  
small></td></tr></table>
```

## NOTES

1. <http://www.fsf.org/>

## SOURCES

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GNU Project. (Last Updated 2008, April 10). GNU Free Documentation License. Retrieved March 23, 2008, <http://www.gnu.org/copyleft/fdl.html>

-. (2008, March 20). Overview of the GNU System. Retrieved March 23, 2008, from <http://www.gnu.org/gnu/gnu-history.html>

Wikimedia Foundation. (2007, December 1). Resolution:License update. Retrieved March 25, 2008, from [http://wikimediafoundation.org/wiki/Resolution:License\\_update](http://wikimediafoundation.org/wiki/Resolution:License_update)





# Which License Should I Choose?

It is difficult to give an exact answer. In some cases of reuse you must abide by the terms of the license and redistribute the OER with the same license. In other cases, it is a matter of personal choice. As discussed in the Creative Commons section, some believe that in order for an OER to be truly free, it must contain a Noncommercial clause to prevent commercial entities from hoarding materials and blocking access to free versions. Others feel that because commercial activity is difficult to define, OER should be licensed without a Noncommercial clause, thus ensuring the widest possible use. The GFDL section of this handbook recommends use of that license if maintaining compatibility with Wikipedia is a primary concern.

When you are ready to license your OER, think of your audience.

- ▶ Will they (the audience) want to use it for something that might be considered commercial activity?
- ▶ Are you concerned about commercial entities using the OER?

- Is it important that others who use your OER share derivatives in the same manner?
- Would it bother me if people changed parts of my OER?

The answers to these questions will help you decide whether or not to use the Noncommercial, No Derivatives and Share Alike clauses, or if a license besides Creative Commons is appropriate. One thing to keep in mind is that if you are the copyright holder, you can separately grant a commercial license or entirely different license to someone, even if your work was initially licensed with the noncommercial condition. As you learn more about OER and the community you will have a better sense of how to license your future OER.

## FREE CULTURAL WORKS DEFINITION

One standard in licensing is called “Free Cultural Works.” A Free Cultural Work is one that is licensed and created in a way that allows:

1. The freedom to use and perform the work: The licensee must be allowed to make any use, private or public, of the work. For kinds of works where it is relevant, this freedom should include all derived uses (“related rights”) such as performing or interpreting the work. There must be no exception regarding, for example, political or religious considerations.
2. The freedom to study the work and apply the information: The licensee must be allowed to examine the work and to use the knowledge gained from the work in any way. The license may not, for example, restrict “reverse engineering.”
3. The freedom to redistribute copies: Copies may be sold, swapped or given away for free, as part of a larger work, a collection, or independently. There must be no limit on the amount of information that can be copied. There must also not be any limit on who can copy the information or on where the information can be copied.

4. The freedom to distribute derivative works: In order to give everyone the ability to improve upon a work, the license must not limit the freedom to distribute a modified version (or, for physical works, a work somehow derived from the original), regardless of the intent and purpose of such modifications. However, some restrictions may be applied to protect these essential freedoms or the attribution of authors (see below).

### Permissible restrictions

Not all restrictions on the use or distribution of works impede essential freedoms. In particular, requirements for attribution, for symmetric collaboration (i.e., “copyleft”), and for the protection of essential freedom are considered permissible restrictions (Various, 2008).

Examples of licenses that follow the Free Cultural Works definition:

- ▶ Creative Commons Attribution[1]
- ▶ Creative Commons Attribution-Share Alike,[2] the license used by this handbook

That Free Cultural Works definition is a standard that has gained some notoriety, but it is not the exclusive definition of freedom. Some disagree with the Free Cultural Works definition and have their own definitions. Whether you choose to follow the Free Cultural Works definition is a matter of personal choice.

## OTHER LICENSES

This handbook discusses the most popular sets of licenses for OER, Creative Commons and GFDL. There are several different “free” or “open” licenses available (one list available at [Opensource.org](http://Opensource.org)). However, some of these licenses are outdated, not widely used beyond a single project, or meant specifically for software. The advantage of using a popular OER license, such as one of the Creative Commons licenses or GFDL, is that people are more familiar with these licenses, and are

therefore more likely to reuse your material. Choosing a popular license also increases the chances of license compatibility with other OER. If you choose a lesser-known license, make sure you understand all the terms of the license before using it.

## SOURCES

Various. (Last Modified 2008 June 24). Definition of Free Cultural Works. Retrieved June 29, 2008, from <http://freedomdefined.org/Definition>



# Perspectives

Why not the Share Alike clause? Personally, I feel that’s a bit onerous saying “I’ll share with you, as long as you adopt the exact philosophy toward sharing content that I do. Otherwise, forget it.” I think it’s a bit conceited to require anyone to adopt a particular license in order to use/reuse/remix/mashup my content (Norman, 2007).

You should choose the license that meets your preferences. The license is a statement as to what others may do with your work, so you should select a license that matches what you are happy for others to do with your work (Cultura Livre, n.d.).

If I had to choose between a license allowing all derivative works and a license allowing none, I’d certainly choose the former. (And I’ve done so; I use the CC-BY license for my blog and newsletter.) (Suber, 2007)

But because I appreciate what copyleft does to software quality and freedom, if I publish something for community development, I want to publish under a copyleft license. As I want to make a living from Free Culture, so [sic] I consider non-commercial terms harmful. Firstly, if I contribute to something with this license, I’ll be unable to use it at all to helping people through paid computer coaching. Secondly, non-

commercial terms create a giant sandbox effect that really limits the Free Culture I can draw on to help people (Understanding Limited, 2007).

The ‘open’ in OER doesn’t just mean, “Take this for free”. It means that if other people think they can improve it, they can lift the cover and change the entire contents and behaviour of the resource (Dewis, 2008).

CC-BY is the most simple to understand and easy to honour license available on CC. (Public Domain is not something commonly recognised outside the USA). If we [Otago Polytechnic] had added other restrictions like NC or SA, then we would somehow have to monitor that, and manage what resources were what. With CC BY as our default, at least we know that anything originating from us simply requires attribution and nothing more; that’s pretty easy to ascertain and should be familiar practice to educational practitioners (Park and Blackall, 2008).

...So what’s the solution? My recommendation is much like Möller’s — use the least restrictive license that you can. But I say “much like Möller’s” because my sense is that he’d really like to see the NC license never used at all, and I believe, given the wide range of creators using CC licenses, there are important cases where a NC license makes sense (Lessig, 2005).

My objection to commercial use is that it is a business model supported by denying access to resources. If a resource must be purchased before it may be used, then it is not free in either sense. A person does not have the freedom to use, modify, etc., something he or she must buy (Downes, 2008).

## SOURCES

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Suber, P. (2007, November 4). Open Access News. Retrieved April 11, 2008, from <http://www.earlham.edu/~peters/fos/2007/11/oa-and-derivative-works-continued.html>

Understanding Limited. (2007, March 27). What is the best Free Culture license? Understanding Design and Computers. Retrieved April 11, 2008, from <http://understandinglimited.com/2007/03/27/licensefun/>





*Image courtesy of **\*\*Solar ikon\*\*** on Flickr*

 BY



# Conclusion

part of a changing education environment

In this chapter

THE FUTURE OF OER

ENCOURAGEMENT

INTRODUCTION TO OTHER HANDBOOKS

ADDITIONAL READING

OER FORUMS

*Image courtesy of “Amir Fathi” on Flickr*



# The Future of OER

OER are just one part of a rapidly changing education environment that is referred to as open education. (See for example Downes, 2005; Keats and Schmidt, 2007; Schmidt and Surman, 2007)

As the movement gains strength, it poses a number of interesting questions related to sustainability and the role of universities in innovation and society. One key question deals with the missing pieces that will allow OER to move from publishing educational resources to truly changing the way we teach and learn. Susan D’Antoni, head of the Virtual Institute of the UNESCO International Institute for Educational Planning, summed up the requirements for this to happen as the four A’s (2006): accessibility, appropriateness, accreditation, affordability. Others (for example Downes, 2007) have started sketching out their ideas on some of these issues.

The following list provides an introduction to some of the questions the international open education community is looking to address in the next few years.

### *Student assessment*

When OER is integrated into a traditional classroom, assessment can follow traditional methods. However, in some cases assessment in open education can be different from traditional assessment. For example, if a student goes through a course on MIT's OCW, there are questions of how that student should be assessed. A standardized test might be possible, but those tests carry limitations and require resources to proctor.

### *Quality of materials, education, learning*

Quality is the primary concern for most people learning about open education and open educational resources. Initially there has been some concern about whether or not OER can be trusted. Over time, this concern seems to have diminished, but has not been eliminated. The repository sections of this handbook covered several places to find OER. What was not mentioned was the quality of these resources. In OER distribution it is fairly common to make a resource available online and receive little feedback on how the OER is being used (if at all). This lack of feedback makes establishing standards of quality difficult. Quality of materials also affects finding materials. Some are concerned that OER repositories will eventually face a large number of well intentioned, but poorly constructed, OER. This excess of OER would make finding high-quality ones more difficult, and might turn educators away from OER. Several in the OER community are finding ways to overcome that possibility including the use of rating systems, folksonomies and specialized search engines.

### *Affordability*

Sustainable production models for OER. This handbook walks through the development of a single OER, such as a course, lesson, or even an individual resource. For these projects, the time and resource commitment shouldn't be too drastic. However, establishing an OER repository, or undertaking large OER projects can be costly and expensive, both to develop and maintain. For the creators of these large OER repositories, it becomes increasingly important to generate enough income to cover costs. Many of these projects rely on funding from non-profit organizations such as the Hewlett Foundation or higher education institutions. But grant money cannot fund OER projects indefinitely. Eventually other forms of support will need to replace this money. OER projects often cite the open source software development model

as their inspiration. In open source software projects, money is raised by soliciting donations, selling manuals, training, software development and providing technical support. While some of these methods can be applied to OER, some can not, and some funding methods remain largely untested. Few of the well-known OER projects exhibit the same vibrant communities of contributors that well-known open source software projects have. This issue is one of the most serious the OER community faces.

### *Global perspective*

Many OER communities form with the express purpose of being global in scope. But inclusion is more difficult than a statement on an organization's charter. Countries with little technological infrastructure are at risk of being underrepresented in OER community decision making. The allocation of funding is also controversial, with some suggesting wealthier countries receive the bulk of OER funding (Wiley, 2007; Downes, "A Review"). Along with the question of funding distribution is how much "absorptive capacity" a country has. In other words, how much assistance can a country effectively handle? Others are concerned about the effect that OER borrowed from one country might have on the culture of another country.

### *Accessibility and access*

Accessibility has been discussed throughout this handbook. As new technologies emerge, accessibility will continue to be both challenged and enhanced. Maintaining accessibility while retaining affordability and simplicity is a concern. Legislation and legal action also shape how accessibility will be handled in the future.

### *Appropriateness / Adaptation*

Understandings regarding adaptation are constantly changing and evolving.

Though these issues are presented individually, each one affects the other. For example, the factors that determine quality influence how students are assessed. Issues such as affordability can affect every part of the OER life cycle.

The challenges the OER community faces are not an indication that it is on the verge of collapse. Rather, it shows a vibrant, self-conscious

community that is in its infancy. Some of these questions are so large and complex it is unlikely that there will be any resolution soon. Nonetheless, in order to ensure the strength and success of the OER community it is important that these questions are carefully - and calmly - considered.

## SOURCES

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Wiley, D. (2007, June 6). For God's Sake, Please Stop the Aid! Iterating Towards Openness. Retrieved May 27, 2008, from <http://opencontent.org/blog/archives/336>



# Encouragement

After going through such an extensive introduction into a community with its own quirks and idiosyncrasies it is natural to feel a little overwhelmed. The complex issues that matter in the OER community, such as copyright, are not often discussed by the general public. However, as education costs continue to grow educators will look for ways for reduce those costs. Given the price of textbooks and multimedia for the classroom, it may be inevitable that OER will be considered as a viable alternative. What that means for your individual OER project is it will probably increase in value over time. Of course, some OER (such as software tutorials) tend to out-date themselves faster than others. Still, it is very likely that someone will be able to use your OER.

Like any “first,” your introductory OER will not be the best one. However, your first effort should not discourage you from future attempts. The OER community is generally very encouraging of new contributions, and will appreciate any new efforts. However, if you do receive any constructive criticism concerning your OER, try to take it as

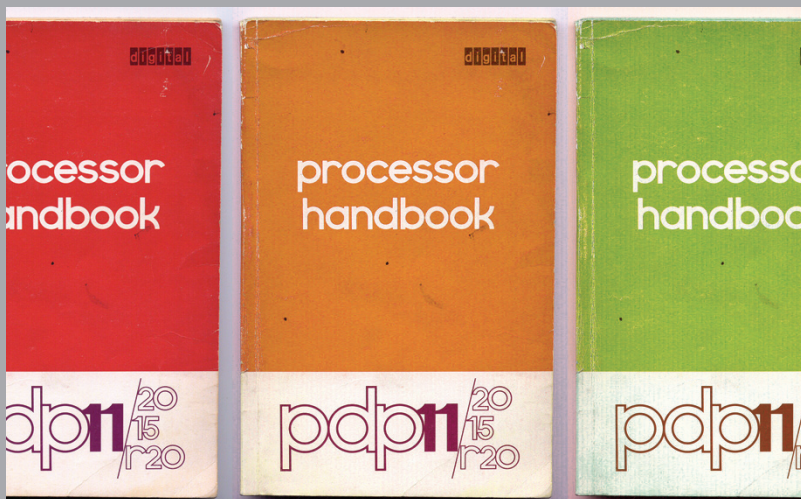
positively as possible. If someone takes the time to criticize an effort, it is largely because that person sees value in at least some of the OER.

After completing your first OER, try to learn from your mistakes in addition to the things that went well. If you are unsure what was successful, find similar OER (same subject matter, same medium) for comparison purposes. In some cases, you will not be able to find a similar OER. That only means that your OER is even more valuable, because it is unique. In those situations, you should find other educators who teach the same, or a similar, subject to receive feedback.

Finding a community to discuss your OER can be helpful, because they can provide support and guidance. Even people online who are knowledgeable about the subject, but have no affiliation with open education, can be helpful in giving feedback. Given the multitude of possible subject areas that can comprise an OER, it is impossible to list everywhere someone can go for advice and community support. The best place to start is a search engine to find message boards and forums related to your subject.

Creating OER can seem like a risky proposition. To spend all that time creating something without knowing what will happen to it means giving up some control. Given the nature of OER, you may never know exactly who it will affect. But by making your OER available, you create a new world of possibilities.

Image courtesy of “psd” on Flickr



# Introduction to Other Handbooks

This handbook has shown Educators how to develop an OER by following the OER lifecycle. It has shown how to find existing OER and provided guidelines for localizing, remixing and using it in the classroom. Additionally, this handbook has pointed to areas of accessibility concerns at all points in the OER lifecycle. As discussed earlier, this handbook was designed for simpler, individual projects as opposed to developing large OER repositories. That is not to say institutional projects aren't valuable. On the contrary, they can be very beneficial. However, projects on that scale are very different from smaller projects.

This Educator handbook is the first in a three-part series. The second is geared towards instructional technologists and IT staff at institutions. That handbook will discuss some of the more technical details behind OER development as well as institutional issues such as long-term



storage and administrative buy-in. It is based on an excellent document from UNESCO and UWC, called the UNESCO OER Toolkit[1]. Parts of this handbook are also based on that document.

The third handbook is geared towards policymakers, including superintendents, administration, and legislators. That handbook will go into greater detail about the advantages and disadvantages of OER on a macro-level as well as discuss institution issues. The policymaker handbook will focus less on technical details.

If you know of anyone who might be interested in these other handbooks, feel free to direct them to <http://www.wikieducator.org/> institution and <http://www.wikieducator.org/policymaker>. You are free to redistribute those handbooks, as well as this one, as long as the terms of the CC-BY-SA license are followed.

## NOTES

1. [http://www.wikieducator.org/UNESCO\\_OER\\_Toolkit\\_Draft](http://www.wikieducator.org/UNESCO_OER_Toolkit_Draft)

*Image courtesy of “LaserGuided” on Flickr*



# Additional Reading

The OER community has many different voices from all over the world. Here is a sampling of some notable people within the OER community:

## BACKGROUND ARTICLES, PAPERS AND PUBLICATIONS ON OER

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Various. (2007, September). Cape Town Education Declaration: Unlocking the promise of open educational resources. Retrieved April 15, 2008, from <http://www.capetowndeclaration.org/read-the-declaration>

## BLOGS ABOUT OER

Abject Learning: Education Technologist at the University of British Columbia. <http://weblogs.elearning.ubc.ca/brian/>

D'Arcy Norman dot net: Educational Technology Developer at the University of Calgary. <http://www.darcynorman.net/>

Flosse Posse: blog by Teemu Leinonen, who has worked on the open repository LeMill (<http://flosse.dicole.org/>) and is currently supporting Mobiled, a mobile learning initiative for Africa. <http://mobiled.uiah.fi/>

Iterating Towards Openness: Utah State University professor David Wiley's blog. (<http://opencontent.org/blog/>) David Wiley has started several open education projects and currently collaborates with COSL (Center for Open and Sustainable Learning). <http://cosl.usu.edu>

K12 Open Ed: experienced K12 educator who now runs an educational technology company. <http://www.k12opened.com/blog/>

Learn Online: Education Developer Leigh Blackall in New Zealand. <http://learnonline.wordpress.com/>

Lessig: blog by Larry Lessig, founder and head of Creative Commons. <http://www.lessig.org/blog/>

OCW Blog: information about Open CourseWare initiatives.

<http://ocwblog.org/>

OERderves: blog by Marshall Smith, Catherine Casserly and Phoenix Wang of the Hewlett Foundation. <http://www.oerderves.org/>

Open Content Holistic Research Environment (OCHRE): research on open education, specifically about OpenLearn.

<http://ochre.wordpress.com/>

OpenFiction Blog: Stephen Carson's blog about MIT OCW and the Open Fiction Project, which is a creative writing Open CourseWare course.

<http://www.tofp.org/blog/>

Open Up!: official blog of COSL, a research group at Utah State University dedicated to open education. <http://cosl.usu.edu/openup/>

OER blogs: list of blogs that discuss open education, automatically updated to reflect new blog posts. <http://oerblogs.org/>

The SPARC Open Access Newsletter: monthly newsletter from Peter Suber, Earlham College (Indiana, USA).

<http://www.earlham.edu/~peters/fos/fosblog.html>

Stephen's Web: Stephen Downes is a senior researcher at the Institute for Information Technology's Internet Logic Research Group. <http://www.downes.ca/> Stephen has a daily newsletter called OLDaily (Online Learning Daily), which highlights newsworthy articles and commentary on current issues in open education.

<http://www.downes.ca/news/OLDaily.htm>

The Stingy Scholar: information on a wide variety of free educational opportunities. Official blog of Textbook Revolution.

<http://stingyscholar.blogspot.com/>

## OER JOURNALS

European Journal of Open, Distance and E-Learning (EURODL): presents scholarly work and information about open, distance and

e-learning, education through telematics, multimedia, on-line learning and co-operation. <http://www.eurodl.org/index.html>

Directory of Open-Access Journals (DOAJ): list of journals that have free access. <http://www.doaj.org/doaj?func=home>

University of Nevada, Reno Libraries: another list of journals with free access. <http://www.library.unr.edu/ejournals/free.aspx>

The Free Medical Journals Site: open access medical journals. <http://www.freemedicaljournals.com/>

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Image courtesy of "Sicily Ellsworthio" on Flickr



# OER Forums

DSPACE: in addition to offering training materials, Dspace also has mailing lists and forums for OER community members, especially for those in developing countries.

<http://www.dspace.org/>

CREATIVE COMMONS: mailing list for discussion about Creative Commons. Previous discussions are archived.

<http://creativecommons.org/discuss>

LEARNINGSPLACE: forum for OpenLearn.

<http://openlearn.open.ac.uk/>

OER COMMONS FORUMS: seven forums dedicated to OER.

<http://forums.oercommons.org/>

OER GRAPEVINE: wiki and mailing list.

[http://oergrapevine.org/OER\\_Grapevine:Community\\_Portal](http://oergrapevine.org/OER_Grapevine:Community_Portal)

OLCOS FORUMS: general OER discussion.

*<http://www.olcos.org/fud/index.php>*

UNESCO IIEP WIKI: though not technically a forum, the OER wiki does bring together many different people interested in OER.

*[http://oerwiki.iiep-unesco.org/index.php?title=Main\\_Page](http://oerwiki.iiep-unesco.org/index.php?title=Main_Page)*



*Space for Personal Notes*



# Appendices

In this chapter

GLOSSARY

LIST OF FILE FORMATS

TRADITIONALLY

COPYRIGHTED REPOSITORIES

# Glossary

For a list of file formats, including XML, please see the next chapter.

**ACCESSIBILITY:** accommodation for persons with disabilities.

**APPLET:** usually refers to Java applets, which are small programs written in the Java (free to download[1]). Applets are often used for small simulations.

**ATTRIBUTION(BY):** Creative Commons license condition that allows others to copy, distribute, display and perform a copyrighted work - and derivative works based upon it - but only if they give credit to the original author.

**BANDWIDTH:** amount of internet traffic a connection can handle. Slow or intermittent internet connections are said to be “low bandwidth.”

**CC-BY:** Creative Commons Attribution license. OER licensed CC-BY can be modified, used commercially and may or may not be shared in the same manner, provided credit is given to the author.

**CC-BY-NC:** Creative Commons Attribution-Noncommercial license. OER licensed CC-BY-NC can be modified and may or may not be shared in the same manner, but credit must be given to the author and it cannot be used commercially.

**CC-BY-NC-SA:** Creative Commons Attribution-Noncommercial-Share Alike license. OER licensed CC-BY-NC-SA can be modified, but must be credit must be given to the author. Additionally, it may not be used commercially and must be shared in the same manner.

**CC-BY-NC-ND:** Creative Commons Attribution-Noncommercial-No derivatives. OER licensed CC-BY-NC-ND cannot be modified or used commercially. It may or may not be shared in the same manner and credit must be given to the author.

**CC-BY-ND:** Creative Commons Attribution-No derivatives license. OER licensed CC-BY-ND may or may not be shared in the same manner, can

be used commercially, but credit must be given to the author and it cannot be modified.

CC-BY-SA: Creative Commons Attribution-Share Alike license. OER licensed CC-BY-SA may be modified and used commercially, provided credit is given to the author and it is shared in the same manner. This license is somewhat similar to the GFDL.

CREATIVE COMMONS[2]: non-profit organization that manages a set of open content licenses.

COPYLEFT: variation of the word ‘copyright’ used to denote open licenses that require derivative works to be shared under the same license as the original.

COSL[3]: Center for Open and Sustainable Learning. Developer of eduCommons software.

DUBLIN CORE: a popular set of metadata fields.

EDUCOMMONS[4]: Software designed to manage an opencourseware project. Developed by COSL.

FOLKSONOMY: Bottom-up classification system. Folksonomies often use tags to describe content. Social bookmarking(Del.icio.us[5], Ma.gnolia[6], etc.) is one popular example of a folksonomy.

FAIR USE: legal term for the usage of copyrighted materials without permission under certain allowable conditions. Also called “Fair Dealing” in some countries. Some countries have no legal provisions for fair use.

FORE: acronym for Free and Open Resources for Education.

FLOSS: acronym for Free/Libre and Open Source Software. Free refers to cost, while ‘libre’ refers to the freedom to modify, adapt and distribute. open source indicates that anyone can view the source code or programming. FLOSS is also referred to as ‘free software,’ ‘open source software,’ ‘libre software,’ and various other acronyms, but all refer to the essentially the same thing.

GFDL[7]: GNU Free Documentation License. Copyleft license sponsored by the Free Software Foundation(FSF).

GNU/GNU/LINUX: an operating system kernel and set of utilities that are freely available. Often abbreviated to “GNU/Linux.”

GRANULARITY: the size of an educational resource. The more granular a resource, the smaller the chunk of information it contains. For example, a single learning object, such as a graphic used in a lecture is more granular than a complete course, though the course can be reduced into more granular parts

HEWLETT FOUNDATION[8]: Non-profit organization that often funds open education initiatives.

I18N: see “Internationalization.”

IMS: a global, nonprofit, member association that provides leadership in collaborative support of standards.

INTERNATIONALIZATION: adapting OER for use in multiple locales.

L10N: see “Localization.”

LEARNING OBJECT: any digital resource that can be reused to mediate learning.

LICENSE: (noun) A legal agreement describing the terms of use of a resource. (verb) The process of choosing and assigning a legal agreement to an open educational resource. OER creators can choose from several licenses offered by organizations such as Creative Commons — with the license typically stipulating the conditions under which that resource can be used, shared, adapted, or distributed by other users.

LOCALIZE: adapting an OER for a specific locale including translation, modifying the formats of dates and currencies, and recontextualizing the OER to be more meaningful for the learners in the local context.

LMS: acronym for Learning Management System. Examples of learning management systems include Blackboard, WebCT and Moodle.

MAC OS X®: proprietary operating system used on Apple computers.

MASHUP: the resulting product of two disparate sources being combined.

**METADATA:** sometimes defined as “data about data.” Information that is part of an OER which describes things such as author, date, institution, etc.

**MOBILE DEVICES:** often used to describe cell phones, but also applies to PDAs and internet-viewing devices that are smaller than a laptop.

**MIT:** Massachusetts Institute of Technology. The first university to create an OCW[9].

**NONCOMMERCIAL(NC):** Creative Commons license condition that allows others to copy, distribute, display and perform a creative work - and derivative works based on it - but for non-commercial purposes only.

**NO DERIVATIVES(ND):** Creative Commons license condition that lets others copy, distribute, display and perform only verbatim copies of a creative work, not derivative works based on it.

**OCW:** acronym for OpenCourseWare. Typically is a collection of higher education courses organized by department. The courses are licensed with a copyleft license.

**OECD[10]:** Organisation for Economic Co-operation and Development.

**ODL:** acronym for Open and Distance Learning.

**OER:** acronym for Open Educational Resource.

**OLCOS:** acronym for Open eLearning Content Observatory Services.

**OPEN SOURCE:** refers to software in which the ‘source,’ or program code is available for anyone to use and modify.

**PHP:** acronym for PHP: Hypertext Processor. It is a computer programming language well-suited for web development and is used for several content management systems.

**PROPRIETARY:** denotes traditional copyright restrictions or something that is exclusive.

**PUBLIC DOMAIN:** a state in which a resource is completely free of any copyright restrictions.

SCORM: acronym for Sharable Content Object Reference Model; a collection of specifications that enables interoperability, accessibility and reusability of web-based learning content.

SHARE ALIKE(SA): Creative Commons license condition that allows others to distribute derivative works only under a license identical to the license that governs the original work.

SOCIAL SOFTWARE: type of software, including websites, that allows for the establishment and maintenance of relationships as well as discourse.

RDF: Resource Description Framework. Format used for sharing structured information. See Standards section in the Use chapter for more information.

REMIX: the act of taking two or more resources and merging them in part or entirety to create a new resource.

RSS: Rich Site Summary, or Really Simple Syndication. A format used to aggregate and distribute web content (e.g. news headlines or blog posts).

TAG: keywords assigned to resources, commonly associated with folksonomies.

UNESCO[11]: United Nations Educational Scientific and Cultural Organization. Supporter of OER initiatives.

URL: acronym for Uniform Resource Link. URLs are more commonly known as “web addresses” and generally look something like <http://www.wikieducator.org>.

USU: Utah State University. A university with an OCW and home to COSL.

UWC[12]: University of the Western Cape.

WIKI: type of interactive website that allows for fast and easy text editing. Many wikis allow anyone to edit them. Example wikis include WikiEducator and Wikiversity.



## NOTES

1. <http://www.java.com/en/download/index.jsp>
2. <http://creativecommons.org/>
3. <http://cosl.usu.edu>
4. <http://cosl.usu.edu/projects/educommons>
5. <http://del.icio.us>
6. <http://ma.gnolia.com/>
7. <http://www.gnu.org/copyleft/fdl.html>
8. <http://www.hewlett.org/Default.htm>
9. <http://ocw.mit.edu>
10. [http://www.oecd.org/home/0,2987,en\\_2649\\_201185\\_1\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/home/0,2987,en_2649_201185_1_1_1_1_1,00.html)
11. [http://portal.unesco.org/en/ev.php-URL\\_ID=29008&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/en/ev.php-URL_ID=29008&URL_DO=DO_TOPIC&URL_SECTION=201.html)
12. <http://www.uwc.ac.za/portal/public/home/index.htm>

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# File Formats

The following is a list of the most commonly used files. Preferred OER formats are recommended, although individual circumstances may require you to use proprietary formats.

## AUDIO

**AIFF:** A proprietary format from Apple. Like WAV, AIFF is uncompressed and is a good choice for audio editing (Apple Computer, Inc., 1991).

**MP3:** Although MP3 is probably the most widely used audio format on the internet, it has had patent issues which make it less than ideal, for OER creation. Still, there is a large amount of software and hardware designed to use MP3, which may make it a good choice in many situations (BBC News, 2007; Williams, 2007).

**OGG VORBIS AND FLAC:** Open formats that are completely free. Ogg Vorbis is a lossy format, like MP3, while FLAC is similar to WAV and AIFF (Xiph.org, n.d.; Coalson, 2008).

**WAV:** A proprietary format from Microsoft and IBM. Although WAV format is patented it is commonly used and is part of the European Broadcast Union standard. WAV files are not ‘lossy,’ which means they do not lose sound quality as they are edited. Although the format is not open, converting to a WAV file makes sense if you are planning to edit audio, as it is the format of choice for many audio editors (Library of Congress, 2005).

*Preferred OER formats: FLAC, OGG Vorbis, MP3.*

## IMAGES

**JPEG:** The most common image format on the internet. There are some patent concerns with JPEG, although its committee has stated that they intend for the format to be free to use. JPEG is considered a ‘lossy’ format, meaning that if the photo is continually edited, the image quality will be reduced. Because JPEG is so commonly used on the internet, it is often used as the final format for OER (Lane, 1999; Clark 2002).

**PNG:** Open format that is similar to TIFF. In the past, some browsers did not support PNG that well, so adoption of the format has been slow. However, all current web browsers, such as Internet Explorer and Firefox, will display PNG files. Growing support for PNG files makes it a good format for OER (W3C, 2003; Microsoft, 2007).

**PSD:** Photoshop Document file (Adobe Systems Incorporated “Photoshop Format”). PSD files are great for editing, but are only compatible with Photoshop.

**SVG:** An open format with promising new features, including animation. Unfortunately, SVG support in web browsers is uneven, making it difficult to recommend as a format for OER. Perhaps, in time, SVG will become a recommended format (Zeidner & Gould, 2008).

**TIFF:** A proprietary format by Adobe. TIFF files are often used when scanning documents. Despite being proprietary, it is not uncommon for TIFF files to be used as a high-quality backup of OER (Library of Congress, 2006).

*Preferred OER formats: PNG.*

## PRESENTATION

**SXI:** Open format for Open Office, Neo Office and Star Office. Unlikely to be compatible with Microsoft Office (FileExt, “SXI”).

ODP: Open Document format. Supported by Open Office, Neo Office, Star Office as well as others (OpenDocument Fellowship, “Application Support”).

PPT: Proprietary format from Microsoft (FileInfo.net, “PPT”). Open source presentation programs try to support it with varying degrees of success.

*Preferred OER formats: ODP.*

## TEXT

ABW: File format used by the open source word processor Abiword (see Office Programs in the Compose OER section for more information). It is based on XML and is therefore easier for other word processors to convert (Various, 2008).

CSV: Stands for “Comma Separated Values.” Essentially it is a plain text file that uses commas to separate individual entries. This format is commonly used by spreadsheets and database applications and is very open (Repici, n.d).

DOC: Proprietary format used by Microsoft Word. The actual format has evolved with Word, but has always been closed. Many other word processors can open and save to DOC format, but the resulting document rarely looks exactly as if it were opened in Microsoft Word (FileExt, “DOC”).

DOCX: XML format that is used in Microsoft Word 2007. Although the format is open for anyone to use, implementing it in other word processors is difficult and support is lacking in word processors besides Word (FileExt, “DOCX”).

DOT: Template document for versions of Microsoft Word before 2007. Compatibility unknown (File.extension, “DOT”).

DOTX: Template document for Microsoft Word 2007. Compatibility unknown (FileInfo.net, 2006).

HTML: Open format managed by the non-profit organization W3C(World Wide Web Consortium) (Jacobs, 2008).

ODT: Open Document format managed by OASIS industry consortium (OpenDocument Fellowship, n.d.). Supported by many open source word processors, Microsoft Word can open ODT files with a plug-in (Paul, 2007).

PAGES: Format used by Apple's Pages program. Currently there are no other word processors that open files in PAGES format (Apple Inc., n.d.).

STW: Template format used by Star Office, Open Office and Neo Office word processors. Compatibility unknown (FilExt, ".SXW Details").

SXW: Text format used by Star Office, Open Office and Neo Office word processors (FileInfo.net, 2008). May be compatible with open source word processors, but not necessarily proprietary ones such as Microsoft Word.

TXT: generic file format based on several standards. Almost universally compatible with any word processor or text editor (FilExt, ".TXT Details").

WPD: Word Perfect word processor file format. Compatibility unknown (FilExt, n.d.).

WPS: Microsoft Works word processor file format. Some compatibility with open source word processors such as Neo Office (FileInfo.net, 2008).

WPT: Microsoft Works template file format. Compatibility unknown (FileInfo.net, 2007).

WRI: Windows Write word processor file format. Compatibility unknown, but unlikely to be good, as Write hasn't been used since Windows 3.1 (File.extensions, 2008).

XHTML: Update of HTML using features of XML. Eventually XHTML is intended to replace HTML. Can be open by many word processors, but appearance may be different than anticipated (XHTML2 Working Group, 2008).

XML: Open format that is very flexible. Many open formats use XML, at least in part, to make a new open format. Future compatibility with XML should be excellent, though it is rarely a format that people type by hand, and is usually generated by text editors or word processors (W3C, n.d.).

*Preferred OER formats: HTML, SXW, TXT, XHTML, XML.*

## VIDEO

MPEG-2: Format with patents by several companies. MPEG-2 is the standard format for DVDs and is used by the Internet Archive (see General Repositories for more information) (Lo n.d.; Internet Archive, n.d.).

MPEG-4: Format with patents held by the same companies as MPEG-2. MPEG-4 files are capable of a wider variety of resolutions and sizes, making it a very flexible format. As with MPEG-2, MPEG-4 is used by the Internet Archive and is a recommended format for OER (Apple Inc., “MPEG-4”; Internet Archive, n.d.).

OGG THEORA: Completely open lossy video format (Xiph.org, “FAQ”). Some players support Ogg with a free plug-in (Xiph.org “downloads”).

QUICKTIME VIDEO (MOV): Format developed by Apple. MOV files are based on MPEG-4, but not as widely supported. Therefore, it is preferable to save OER as MPEG-4 (Apple Inc., 2007).

SWF AND FLV: Format owned by Adobe. SWF files can be viewed by the vast majority of web browsers and platforms (Windows, Mac and GNU/Linux). Because SWF files can be viewed by so many different people, it is one of the most common formats for video and animation on the internet. Unfortunately, editing SWF files is very difficult and is not recommended for OER development. FLV is the video format that is used for video while developing SWF files. Neither file format is recommended for OER, but may be unavoidable in certain situations. If you must use a SWF for OER, it is recommended that you also make

the FLA available (Library of Congress, 2007; Gay, n.d.; Adobe Systems Incorporated, n.d.).

WINDOWS MEDIA FILE (WMV): Developed by Microsoft, but is an open format. Although WMV files produce good quality with a small file size however, MPEG-2 or MPEG-4 is preferable to WMV (Microsoft, 2008).

*Preferred OER formats: MPEG-4, Ogg Theora.*

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# Traditionally Copyrighted Repositories

The following is a list of repositories that reserve copyright. Levels of access vary, with some repositories requiring registration, while others do not. Though it might be argued that these repositories are not OER, they have been included because of their pedagogical value.

REPOSITORY AND TYPE	DESCRIPTION	NUMBER OF RESOURCES
<i>Athabasca University</i> - Open University in Canada ( <a href="http://www.athabascau.ca/">http://www.athabascau.ca/</a> )  OpenCourseWare	Athabasca University (AU) is Canada's leading distance-education and online university; Canada's Open University. AU currently serves about 32,000 students per year, following a period of rapid growth which has seen student numbers double over a six-year period. Some 260,000 students have registered in AU's individualized courses and programs since the University was created by the Government of Alberta in 1970.	Unknown

REPOSITORY AND TYPE	DESCRIPTION	NUMBER OF RESOURCES
<p><i>DAREnet</i> (<a href="http://www.darenet.nl/en/page/language.view/search.page">http://www.darenet.nl/en/page/language.view/search.page</a>)</p> <p>Image and text library</p>	<p>DAREnet was launched in January 2004 to demonstrate the network of the local collections of digital documentation held by all Dutch universities and several related institutions. DAREnet harvests all “full content” digital material from the local repositories, presents it in a consistent form and makes it searchable. Materials include teaching and learning resources, and academic research output, in both English and Dutch.</p>	<p>100,000 resources</p>
<p><i>Education Network Australia</i> (EdNA) (<a href="http://www.edna.edu.au/edna/go/search/">http://www.edna.edu.au/edna/go/search/</a>)</p> <p>OpenCourseWare</p>	<p>Database of web-based resources useful for teaching and learning from several Australian repositories. It is organized around Australian school and high school curriculum, its tools are free to Australian educators, it is funded by the bodies responsible for education provision in Australia and run by a non-profit company. Anyone may access the EdNA website and use the resources, information and communication areas for education and training purposes</p>	<p>Unknown</p>

REPOSITORY AND TYPE	DESCRIPTION	NUMBER OF RESOURCES
<p><i>ide@s</i> (<a href="http://ideas.wisconsin.edu/">http://ideas.wisconsin.edu/</a>)</p> <p>Image library/lesson plans and ideas</p>	<p>An initiative by the University of Wisconsin to identify, evaluate, catalog, and align to the Wisconsin education standards resources that are already on the Internet, such as lesson plans and reference materials. These resources are then made available from the <i>ide@s</i> search engine. Covers pre-kindergarten through higher education as well as adult learning. Additionally, there are more than 100 video documents under <i>Videoide@s</i> which provides access to Wisconsin Public Television and Wisconsin Educational Communications Board programs as streaming video</p>	Unknown

## SCIENCE REPOSITORIES

REPOSITORY AND TYPE	DESCRIPTION	NUMBER OF RESOURCES
<p><i>arXiv.org</i>  <i>e-Print archive</i>                      (http://arxiv.org/)</p> <p>Library of                      texts</p>	<p>arXiv(pronounced as the word “archive”), set up by Cornell University, is an e-print archive specializing in Physics, Mathematics, Nonlinear Sciences, Computer Science and Quantitative Biology. It contains more than 380,000 documents, mainly as Postscript and PDF files. It is mainly designed for graduate education. No license agreement is published, so full copyright protection has to be assumed, but at least it is free to read.</p>	<p>Over 485,365</p>
<p><i>CITIDEL</i>                      (Computing                      and                      Information                      Technology                      Interactive                      Digital                      Educational                      Library)                      (http://www.citidel.org/)</p> <p>Library of                      texts</p>	<p>A collaboration between Hofstra University, the College of New Jersey, Pennsylvania State University, Villanova University and Virginia Tech, as part of the US National Science Foundation’s National Science Digital Library Project, to create a portal for computing education. CITIDEL is a digital library of educational resources for the computing field, harvested from ten different source collections. It contains to a wide variety of resources, addressed to a diversity of educational levels.</p>	<p>488,256                      resources</p>

<p><i>DLESE</i> - Digital Library for Earth System Education (<a href="http://www.dlese.org/">http://www.dlese.org/</a>)</p> <p>Library of text, images, lesson plans, etc.</p>	<p>Funded by the US National Science Foundation, DLESE provides learners and educators at all levels with access to materials to support Earth system science education. The collection includes lesson plans, maps, images, data sets, assessment activities, curricula and online courses. The site also provides support services to help users effectively create, use and share OER, as well as communication networks to facilitate interactions and collaborations across the field of earth science.</p>	<p>Over 25,000 learning objects</p>
<p><i>ESCOT Home Page</i> (<a href="http://www.escot.org/">http://www.escot.org/</a>)</p> <p>Library of simulations and animations</p>	<p>ESCOT is a testbed for the integration of innovative technology in middle school (K-12) mathematics. The project investigates replicable practices that produce predictably high quality digital learning resources. It contains graphs, tables and simulations, as well as tools for manipulating geometry and algebra, which can be integrated in math education software.</p>	<p>Over 10</p>



<p><i>Exploratories</i> (<a href="http://www.cs.brown.edu/exploratories/home.html">http://www.cs.brown.edu/exploratories/home.html</a>)</p> <p>Library of simulations</p>	<p>A project of Brown University's Computer Graphics Research Group to create a set of exemplary Web-based learning objects (Java applets) that teach concepts in introductory computer graphics at the college and graduate level. Users can download complete Java applets, or build their own from the components collection. The project also publishes the results of its research into creating useful learning objects, and is working toward the creation of a complete Design Strategy Handbook.</p>	<p>71 java applets</p>
<p><i>Geoscience Data Repository</i></p> <p>Library of images and text</p>	<p>The collection of Earth Sciences Sector geoscience databases that is managed and accessed by a series of Information Services (GDRIS). This site allows for you to discover, view and download, free of charge, thousands of maps since the mid-1800's, hundreds of digital maps from the Geological Survey of Canada, data related to fossil fuels (oil, gas, coal) in Canada.</p>	<p>400 geochemical surveys</p>

<p><i>iLumina</i> (<a href="http://www.ilumina-dlib.org/">http://www.ilumina-dlib.org/</a>)</p> <p>Library of image, text and video</p>	<p>Part of the US National Science Foundation's National Science Digital Library Project, iLumina is a digital library of sharable undergraduate teaching materials for chemistry, biology, physics, mathematics and computer science. Resources range from small learning objects, such as individual images and video clips, to entire courses and several virtual collections. Both technical and education-specific metadata about each resource is available. Users may contribute their own resources. iLumina was developed by the University of North Carolina at Wilmington, Collegis, Inc., Virginia Tech, Georgia State University, Grand Valley State University and the College of New Jersey.</p>	<p>Over 1,500 resources</p>
<p><i>Intute: Science, Engineering and Technology</i> (<a href="http://www.intute.ac.uk/sciences/">http://www.intute.ac.uk/sciences/</a>)</p> <p>Library of images and text</p>	<p>A free online service providing access to the very best Web resources for education and research, evaluated and selected by a network of subject specialists. It covers the physical sciences, engineering, computing, geography, mathematics and environmental science.</p>	<p>33,094 resources</p>

<p><i>The Math Forum @ Drexel University</i> (<a href="http://mathforum.org/">http://mathforum.org/</a>)</p> <p>Library of games and lesson plans</p>	<p>The Math Forum is a the leading online resource for improving math learning, teaching, and communication since 1992, created by teachers, mathematicians, researchers, students, and parents. It offers a wealth of problems and puzzles, online mentoring, research, team problem solving, collaborations and professional development.</p>	<p>Unknown</p>
<p><i>Math World</i> (<a href="http://mathworld.wolfram.com/">http://mathworld.wolfram.com/</a>)</p> <p>Library of images and text</p>	<p>Created by Wolfram Research. Contains web based (HTML) resources about algebra, applied mathematics, calculus and analysis, discrete mathematics, geometry, history, number theory, probability, statistics and topology, among others. No educational range is given, but subjects start mainly at the high school level and reach graduate level. The HTML headers of each page contain Dublin Core and Mathematics Subject Classification metadata (which is useful for other repositories). One interesting kind of resource is the classroom, which provides a set of pop-up “capsule summaries” for more than 300 mathematical terms.</p>	<p>Unknown</p>

<p><i>National Programme on Technology Enhanced Learning</i> (NPTEL) (<a href="http://nptel.iitm.ac.in/home.php">http://nptel.iitm.ac.in/home.php</a>)</p> <p>Open-CourseWare</p>	<p>Launched in September 2006, NPTEL is a joint venture of seven Indian Institutes of Technology (IITs) and the Indian Institute of Science Bangalore, funded by the Indian Ministry of Human Resource Development. The main objective of the programme is to enhance the quality of engineering education in India by developing curriculum-based video and web courses at all levels of undergraduate and postgraduate teaching - learning materials, digitally taped classroom lectures, supplementary materials and links to research materials. Message boards are also available for each course.</p>	<p>118 courses in 6 areas of engineering</p>
<p><i>NEEDS</i> (National Engineering Education Delivery System) (<a href="http://www.needs.org/needs/">http://www.needs.org/needs/</a>)</p> <p>Library of images and text</p>	<p>A digital library of learning resources for engineering education. NEEDS provides web-based access to a database of learning resources where learners and instructors can search for, locate, download and comment on resources to aid their learning or teaching process. It is possible to search for resources suitable for mobile devices (so-called “Learning Everywhere” resources). NEEDS also supports a multi-tier review system for resources, from an industry-sponsored national award competition, to user-based reviews of individual learning resources. Materials are mainly at the undergraduate level. <i>Note: Users will be charged a fee to access some content.</i></p>	<p>1,220 resources</p>

<p><i>NSDL</i> (National Science Digital Library) (<a href="http://nsdl.org/">http://nsdl.org/</a>)</p> <p>Library of text and images</p>	<p>Created by the US National Science Foundation to provide organized access to high quality resources and tools that support innovations in teaching and learning at all levels of science, technology, engineering, and mathematics education. NSDL provides an organized point of access to content that is aggregated from a variety of other digital libraries, NSF-funded projects, and NSDL-reviewed web sites. It also provides access to services and tools that enhance the use of this content in a variety of contexts. NSDL is designed primarily for school-level educators, but anyone can access and search the library at no cost. Access to most of the resources is free; however, some content providers require a nominal fee or subscription to retrieve their specific resources. Note: Users will be charged a fee to access some content.</p>	<p>554 collections of resources</p>
<p><i>OAster</i> (<a href="http://oaister.umdl.umich.edu/o/oaister/">http://oaister.umdl.umich.edu/o/oaister/</a>)</p> <p>Library of text</p>	<p>OAster is a project of the University of Michigan Digital Library Production Service. The goal is to create a collection of previously difficult-to-access, academically-oriented digital resources.</p>	<p>9,771,738 records from 701 institutions</p>

<p>SMETE (<a href="http://www.smete.org/smete/">http://www.smete.org/smete/</a>)</p> <p>Library of text</p>	<p>The SMETE (Science, Match, Engineering and Technology Educational) Digital Library is a dynamic online library and portal of services by the SMETE Open Federation for teachers and students, specializing in science, mathematics, engineering and technology education, addressing all levels of education. Partially supported by the National Science Foundation, National STEM Education Digital Library program. 15,885 resources for science, technology, engineering and mathematics.</p>	<p>20,000 resources</p>
<p><i>Virtual Courseware Project</i> (<a href="http://www.sciencecourseware.org/">http://www.sciencecourseware.org/</a>)</p> <p>Library of simulations</p>	<p>A project of the US National Science Foundation and California State University to create interactive, online simulations for the life science laboratory or for earth science field studies. The activities are designed to enhance an existing curriculum and include online assessments. They can be used by school and college level students.</p>	<p>18 labs and simulations for the life and earth sciences</p>

## SOCIAL SCIENCE

REPOSITORY AND TYPE	DESCRIPTION	NUMBER OF RESOURCES
<p><i>LoLa Exchange</i> (<a href="http://www.lolaexchange.org/">http://www.lolaexchange.org/</a>)</p> <p>Library of images and text</p>	<p>LoLa is the home to a Information Literacy Learning Object collection of the Wesleyan University (Connecticut). It is also an common pool of learning objects that staff of this university are developing.</p> <p>LoLa allows staff to discover materials developed by other faculty, and provide opportunities for collaboration within the academic disciplines on the Wesleyan campuses. LOLA is also the home to a collection of Information Literacy Learning Objects that being developed as part of a collaborative Information Literacy Project between Wesleyan, Trinity, and Connecticut College. At the moment the exchange is in beta version.</p>	<p>Around 40 learning objects</p>

## HUMANITIES

REPOSITORY AND TYPE	DESCRIPTION	NUMBER OF RESOURCES
<i>Archival Sound Recordings</i> <a href="http://sounds.bl.uk/">(http://sounds.bl.uk/)</a>  Library of music, speeches and sounds	The British Library in association with JISC gives access to selected recordings of music, spoken word, and human and natural environments. Anyone can search or browse the information on this site. Note: For copyright reasons, only people in licensed UK higher and further education institutions, or in designated reading rooms can play the recordings. Downloading is only available for licensed institutions.	12,000
<i>Digital Scriptorium</i> <a href="http://www.scriptorium.columbia.edu/">(http://www.scriptorium.columbia.edu/)</a>  Library of text and images	The Digital Scriptorium is an image database of medieval and renaissance manuscripts, intended to unite scattered resources from many institutions into an international tool for teaching and scholarly research.	15,000 images and 3,510 manuscripts and documents
<i>Intute: Arts and Humanities</i> <a href="http://www.intute.ac.uk/artsandhumanities/">(http://www.intute.ac.uk/artsandhumanities/)</a>  Library of images and text	A free online service providing access to the very best Web resources for education and research, evaluated and selected by a network of subject specialists in the Arts and Humanities fields. Over	18,000 resources



REPOSITORY AND TYPE	DESCRIPTION	NUMBER OF RESOURCES
<i>The Education Podcast Network</i> ( <a href="http://epnweb.org/">http://epnweb.org/</a> )  Library of podcasts	The Education Podcast Network is an effort to bring together into one place, the wide range of podcast programming that may be helpful to teachers looking for content to teach with and about, and to explore issues of teaching and learning in the 21st century.	1,000
<i>Toolbox Library: Primary Resources in U.S. History and Literature</i> ( <a href="http://nationalhumanitiescenter.org/pds/index.htm">http://nationalhumanitiescenter.org/pds/index.htm</a> )  Open- CourseWare	Series of lessons covering periods in U.S. History such as the build-up to the Civil War and African American history.	7

## FREE TEXTBOOKS

REPOSITORY AND TYPE OF TEXTBOOKS	DESCRIPTION	NUMBER OF RESOURCES
<i>Air University Press</i> ( <a href="http://www.maxwell.af.mil/au/aul/aupress/">http://www.maxwell.af.mil/au/aul/aupress/</a> )  Military	U.S. Air Force publisher. PDF download. Exact number of titles unknown, but likely several dozen.	Over 50
<i>Bibli's Bookshelf</i>  Children's stories	Illustrated children's stories from authors such as Aesop, Hans Christian Anderson and Beatrix Potter.	Over 50 books
<i>Bibliomania</i> ( <a href="http://www.bibliomania.com/">http://www.bibliomania.com/</a> )  Classic	Public domain texts from popular authors (Jane Austen, Charles Dickens, etc.). Includes study guides for some texts.	Around 2,000 texts
<i>Bartleby</i> ( <a href="http://www.bartleby.com/">http://www.bartleby.com/</a> )  Classic	Selections of fiction and non-fiction books.	Over 70 books
<i>EBIND Digital Collections</i> ( <a href="http://diglib.lib.fsu.edu/ebind/docs/">http://diglib.lib.fsu.edu/ebind/docs/</a> )  Children's stories	Children's literature books between 1894-1904.	Over 30 books
<i>eScholarship editions</i> ( <a href="http://www.escholarship.org/editions/">http://www.escholarship.org/editions/</a> )  Humanities	Collection of open access books across a variety of subjects in the humanities.	Not all of the books listed at eScholarship are open access, only 773 of 2,000

REPOSITORY AND TYPE OF TEXTBOOKS	DESCRIPTION	NUMBER OF RESOURCES
<i>Global Text Project</i> ( <a href="http://globaltext.terry.uga.edu/node/21">http://globaltext.terry.uga.edu/node/21</a> ) Business	The Global Text Project has also proposed several business textbooks.	21 textbooks
<i>Gutenberg&lt;e&gt;</i> ( <a href="http://www.gutenberg-e.org/">http://www.gutenberg-e.org/</a> ) General	Open access books on topics ranging from gender to politics.	Likely over 1,000
<i>International Children's Digital Library</i> ( <a href="http://www.icdlbooks.org/">http://www.icdlbooks.org/</a> ) Children's stories	Open access children books, sorted by target age, length and other criteria. Some books are available in multiple languages. Requires free Java download.	2657 books
<i>McMaster University Archive for the history of economic thought</i> ( <a href="http://socserv2.socsci.mcmaster.ca/~econ/ugcm/3ll3/index.html">http://socserv2.socsci.mcmaster.ca/~econ/ugcm/3ll3/index.html</a> ) Economics	Economic and law books in PDF format. Designated for non-commercial use only.	Number of books unknown, but likely several hundred
<i>Ohio State Press</i> General	<i>Collection of peer-reviewed books from Ohio State University.</i>	Over 50 books
<i>University of Michigan Digital General Collection</i> ( <a href="http://quod.lib.umich.edu/genpub/">http://quod.lib.umich.edu/genpub/</a> ) General	Open access texts, searchable with several different kinds of queries. Does require some time to sort through search results.	Over 28,000 books and documents

REPOSITORY AND TYPE OF TEXTBOOKS	DESCRIPTION	NUMBER OF RESOURCES
<i>University of Pittsburgh Press</i> ( <a href="http://digital.library.pitt.edu/p/pittpress/">http://digital.library.pitt.edu/p/pittpress/</a> )	Collection of books, specializing in Latin American studies.	39 books
General/ Latin America		

## SOURCES

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# Online OER Handbook

The online version of this handbook is on WikiEducator:

- ▶ [http://www.wikieducator.org/OER\\_Handbook/educator\\_version\\_one](http://www.wikieducator.org/OER_Handbook/educator_version_one)

The second edition is also being developed on WikiEducator. Everyone is welcome to contribute:

- ▶ [http://www.wikieducator.org/OER\\_Handbook/educator](http://www.wikieducator.org/OER_Handbook/educator)

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